

SatFACTS

MONTHLY



Reporting on "The World" of satellite television in the Pacific Ocean Region

IN THIS ISSUE

T.E.D. RECEPTION

Just How Good
is the
Palcom 7900?

POLARISATION GAME

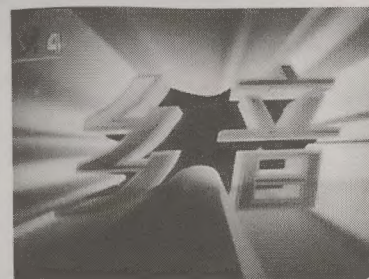
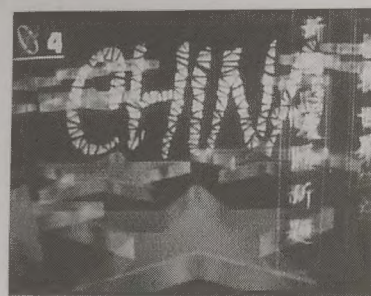
It's All About Not
Leaving dBs Behind

STILL MORE:

Narrow Band
Techniques,
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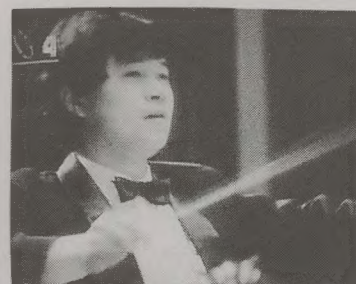
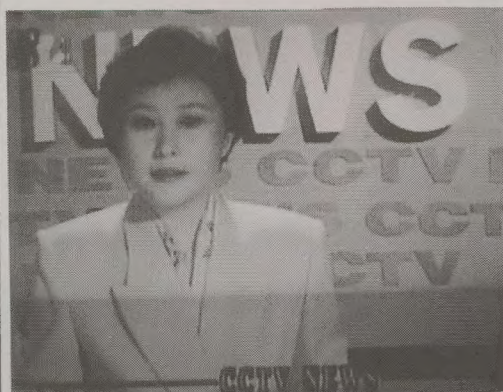
- ✓ Latest programmer news
- ✓ Latest hardware news
- ✓ Latest SPACE Pacific
Programming Access
- ✓ Cable TV
Connection

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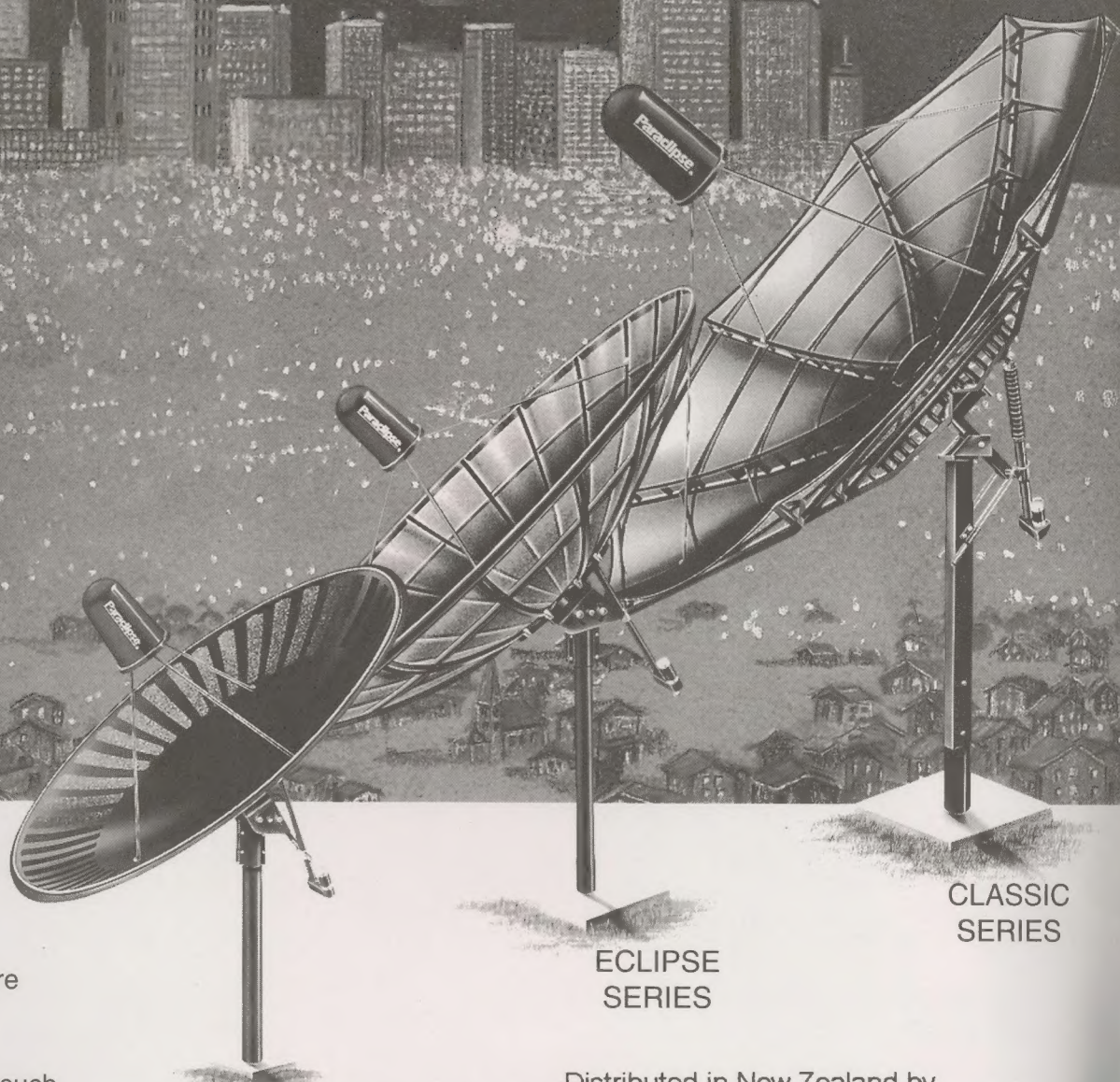


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SatFACTS

MONTHLY

SatFACTS Monthly is published 12 times each year (on or about 15th of each month) by Far North Cablevision, Ltd. This publication is dedicated to the premise that as we enter the 21st century, ancient 20th century notions concerning borders and boundaries no longer define a person's horizon. In the air, all around you, are microwave signals carrying messages of entertainment, information and education. These messages are available to anyone willing to install the appropriate receiving equipment and, where applicable, pay a monthly or annual fee to receive the content of the messages in the privacy of their own home. Welcome to the 21st century - a world without borders, a world without boundaries.

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COOP'S COMMENT

During October Galaxy's Ed Guz (Director of Engineering) and Sean O'Connell (Marketing) visited New Zealand to survey just how poorly Optus B3 coverage for their NTL/Iredito format MPEG DTH service really is here. The pair flew into Kaitia, rented a car and drove over to Coopers Beach to evaluate B3 (and B1) reception on our 2.1m spun dish Ku installation. Then they headed south to perform similar evaluations with stops at locations such as Paraparaumu's Kiwi Cable TV. The C/NR (carrier to noise ratio) observations, for dishes under 3m, were not encouraging for the expansion of Galaxy DTH to New Zealand using the B3 footprint.



November 15, 1995



(Above) Coop changing Optus birds on 2.1, the Galaxy duo observes results on analyser. Below, O'Connell, Coop, Guz. Optus B3's banana beam won't do it.



Panasonic receivers is experiencing 'EMC' (interference from electrical powering sources). The wonderful world of DVB compliant MPEG is going to be a bit longer in arriving to your home.

I knew their new Iredito conditional access system and Pace receivers were experiencing field problems. To their credit, Guz would only respond to my questions concerning "what is wrong?" with a terse, "Word certainly travels fast."

Indeed it does. Galaxy DTH installations throughout Australia are proceeding but at least to press-time they are being done without receivers ("decoders"). Galaxy sign-ups are getting a dish (often 1.2m), LNB, cabling but no receiver.

There is a "software glitch" (Guz's only comment on the technical nature of the problem). I am told by other Pace/Iredito sources the "glitch" is a 3 to 4 second lockup time (delay) when changing channels within the same transponder. It is difficult to sell a multiple channel service to consumers if the delay between channels is 3 or 4 seconds.

Elsewhere in the world, the South African rollout of MPEG using Iredito conditional access and

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Programmer / Programming Update -p.2; Hardware / Equipment Update -p.4

SPACE Notes: CCTV and Hotel Service Approval -p.22 ; With The Observers -p.24

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SatFACTS Orbit Watch -p.31; November Reporting Form -p.33

-ON THE COVER-

China Central Television has agreed to make its 24 hour Mandarin/English service (PAS-2, TR2, 1426 MHz IF) available free of charge. SPACE Member Harry Guo of Western Australia made it happen; details in SPACE Notes, p.22 this issue.

MEET Michael Fleck



What do you do if you represent a total line of semi and fully professional TVRO system hardware and you want to move dish systems to commercial users, such as hotels? You start a second company to represent the programmers! You see, if you can offer a wide range of programming, then selling TVRO dish systems is a piece of cake.

Meet Michael Fleck, 40 years young and hitting his stride as the creative genius behind Global•Vision Sydney. Michael believes there is life after DTH and it is called DTB (direct to business television) and his firm creates and manages special event networks. You say you want to distribute your company annual sales meeting to 200 sites from Korea to Dunedin? Michael's the guy. At SPRSCS he will conduct a seminar on Thursday January 25th detailing how your business becomes a part of DTB, providing important downlink and other services that hotels and facilities need. Yes, there is money in DTB.

**SPACE Pacific's
South Pacific Region Satellite
& Cable Show January 23-27:
Auckland
Info? Fax 64-9-406-1083**

PROGRAMMER PROGRAMMING PROMOTION

UPDATE

NOVEMBER 15, 1995

One fast moving bird! Palapa B2P, scheduled for replacement with new C1 satellite after January launch (SF#13, p. 6), is headed for inclined orbit with great speed. Bird is already ± 0.10 degree, will be ± 0.19 by 31 December. By 1 March ± 0.33 and year from now nearly (\pm) 0.8 degrees. That number is approximately same as Rimsat G2 was back on 1 January of this year. Assuming a changeover to C1 from B2P by 1 March (1996), even 3.7m dishes should still not really notice the movement (which is noticed at about ± 0.75 degree movement). The trick is to get your dish aimed at the "zero crossing" point which is the centre of the figure '8' loop so as to not notice the satellite's movement. If you are 12' or less and do notice wandering B2P signals, that means your dish is mis-aimed high (or low) of B2P position over equator.

One slower moving bird. AsiaSat 2 final checkout underway after being lashed to Long March 2E lift-off vehicle at Xichang Satellite Launch Centre. Launch window extends from 'now' until approximately 10 December, bird is headed to 100.5E.

Russian sources tell SF through reader (Mrs. Brian Rasmussen) Express class satellite at 14W is only Express now operational. Express 6 is scheduled to 80E "first half 1996" to be followed later in year by #5 to 53E and #7 to 90E.

PanAmSat PAS-4 will carry Japanese NHK and India's Doordarshan international services; Indian service will include C + Ku transponders with C-band service relayed via PAS-1 into North America as well. NHK will use twin PAS-4 Ku beams, one into Europe and second on NE Asia beam for coverage back into Japan and surrounding Asian continental region.

AsiaSat 3 has been announced, hopes for launch sometime in 1997, to 122E. Details of planned footprints are not available but company's press release stresses coverage for Asia ("*targeted beam coverage of India, China*") with no mention of Pacific.

New C + Ku "DBS" satellite fronted by Thailand magazine publisher ABC will pretend to be headquartered in Laos to avoid Thai government restrictions. This one is not likely to have Pacific coverage.

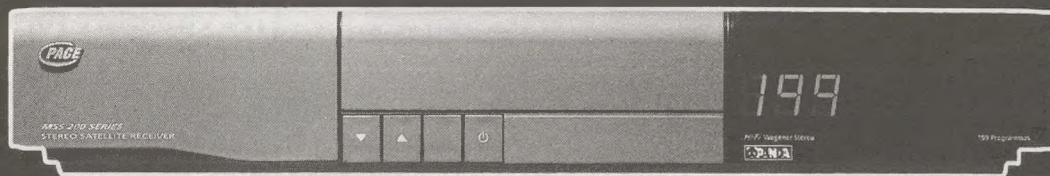
PanAmSat has announced PAS-7 for Indian Ocean region, PAS-8 for Pacific Ocean region "*in 1997*." They also plan first commercial use of Ka-band (using wavelengths so short that a teacup sized antenna will be practical) for 58W and 79W.

Australian firm Skandia has been appointed as official exclusive distributor for Australia, New Zealand, New Guinea and Pacific Islands on behalf of STAR TV's hardware division, STARnet. Sub-distributors, dealers for equipment packaged to implement reception of STAR TV services via AsiaSat 2 are now being established (Leon Senior, 61-3-9819-2466).

The Music Zone (TMZ; "All Music, All The Time") is offering to allow cable TV systems in Pacific within reach of their transponder 9V (1168 MHz IF) signal two week trial access for evaluation purposes. TMZ has headquarters in Florida but operational control is in Denver (Sam Klosterman, fax 1-303-267-7007). Firm began service using GI "SR 1600 IRD SCPC Mode C" last April on PAS-1 (over Atlantic), is now on PAS-2 using SA mode MPEG (D9222 receiver) claiming to have 4 video channels there in both NTSC and PAL.

Adult programmer SPICE has a major setback, service delayed.

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Welle, *EMTV*, *Star Plus*, *Chinese Channel* and *Zee TV*.

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MEET Jo Thompson



Creator of the CMT (Country Music Television) **Dance Ranch Romp**, this international television star will headline the CMT Dance Ranch stage show January 27th during SPRSCS "Open Public Day." Jo, Miss Texas in 1987 and a finalist in the Miss America Pageant, will be on hand assisting a buckboard full of CMT professionals to explain what the Country Music Television craze is all about to attendees January 24-27

(show stand 234-D).

During the CMT Dance Ranch stage show, Jo will put hundreds (perhaps thousands!) to work in staging what is billed as the World's Longest Line Dance. All of this is more than simply fun and games: It is the deadly serious business of establishing CMT in the Pacific as a top rated home DTH and cable TV programming service. Welcome, Mr New Dish Dealer, to the wacky world of show business!

**South Pacific Region
Satellite & Cable Show
January 23-27 ♦ Auckland
Details: Fax 64-9-406-1083**

HARDWARE EQUIPMENT PARTS

UPDATE

NOVEMBER 15, 1995

"Dish Crane," popularised by new Bay Satellite antenna assembly and installation video featuring Paracclipse dish-pert Tim Alderman, is made in USA but could easily be "copied" for manufacture in Pacific by reasonably clever mechanical engineer. Constructed of Aluminium and Magnesium, device straps to side of pole mounts as tall as 6.1 metres, or can lift dishes (up to 12' mesh) safely to roof of 2 storey home. Unit from factory has 50'15.3m of 1/8"/3.2mm galvanised steel lifting wire-rope, galvanised steel tubing with 1700 pound breaking strength and 400 pound working load. The "real" Dish Davit from Universal R&D, PO Box 9942, Ashville, NC (USA), 28815 at US\$230 plus shipping. Until you have tried to lift a 3 or 3.7m dish to the top of a mounting pole, or have attempted to place a dish on an inclined surface (side of hill, sloping roof), you cannot appreciate the beauty of this tool.



Have Dish - will travel. Auckland / Wellington / Brisbane Signal Master is placing trailer mounted 3m+ dishes on road to demonstrate home satellite TV. System set-up time with everything on board: 30 minutes, as you will see at SPRSCS demo.



SF#14 Postscript:

Our October report on measured performance of Paracclipse 4.5m dishes noted, "*The larger Paracclipse surface produced on average 1.0 to 1.5 dB more gain than the Orbitron 3.7 (m).*" True, but with now updated results. The 4.5m has f/D of .31 so we tried Chaparral Dual (orthomode) Feed both with and without "Golden Ring" insert. Nominally, this feed has peak performance at f/D in .36 region, or .3 f/D with addition of optional Golden Ring. At Tim Alderman's suggestion, Doubtless Bay Cable TV brought in ADL RP-100 dual (ortho) feed

for comparison. We found instant 1+ dB more signal with ADL over best of Chaparral and will be replacing all Chaparrals with ADLs shortly.

Wireless Primer is new nuts and bolts book for anyone planning or studying microwave (MMDS) transmission and delivery systems. Authors Bostick & Bostick take you through every facet of this challenging subject in easy to grasp format; highly recommended. Co-author Glyn Bostick has seminar at SPRSCS, may even bring copies with him from CEC Syracuse.

THE WIRELESS PRIMER

A Basic Description of MMDS Television Systems

By Emily Bostick & Glyn Bostick
Edited by R.E. Mott & Jere Schaffel



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Input Level: -65 to -25dBm
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THE PALCOM SL-7900 & SL-8000 RECEIVERS

Part One of Two

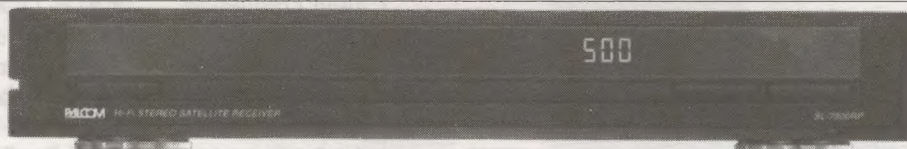
What Others Say

European consumer dish magazine What Satellite TV in their April 1995 issue went about as far as a consumer magazine that depends upon advertising support (from satellite receiver manufacturers) could go when it wrote:

"The picture quality is excellent ... with a wildly low 3dB threshold ... (and) TED sensibly available in 32 (steps)."

WST was describing in some detail the performance of the Palcom SL-8000RP receiver to a European market where the art of receiver refinement leads all sectors of the globe by a year or two. The European satellite TV world is essentially a Ku universe of 60 to 90cm dishes, hundreds of channels to select from, and tiny backyards (if indeed there is any yard at all). Successful receiver suppliers have learned that to compete they must substitute receiver performance for antenna gain since most consumers are restricted to placing tiny dishes on windowsill

flower box
mounts by local
ordinances or
landlord
restrictions.



Palcom's Model 7900-RP Threshold Extension Demodulator receiver

The Palcom SL-7900 was first introduced into the Pacific in May of this year by AV Comm Pty Ltd of Sydney; more recently by Bay Satellite TV in Hastings. The SL-8000RP is the top of the line ultra-sophisticated model that offers a unique feature that any serious satellite TV enthusiast will appreciate: The ability to tune two separate satellite signals simultaneously placing one programme on the screen while the second programme sits inside the main programme display (the Picture In a Picture, or PIP feature). With two separate tuners (and 3 IF inputs) the enthusiast has access to not only two programmes at once on the screen, but also to as many as three different dishes or antenna feed systems. At the present state of receiver art, this is about as close as one can be to satellite nirvana.

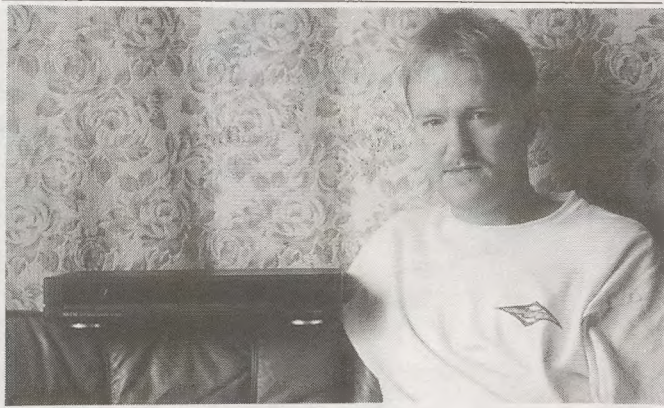
SF first borrowed an SL-7900 from Bay Satellite TV. That gave us an opportunity to conduct real world measurements of the performance. But we found the transition from older style analogue receivers challenging ("Older style": They have knobs on them which you grasp between thumb and forefinger and rotate to achieve changes in reception). Is a receiver that forces you to read the manual to operate it (i.e., the SL-7900RP) sufficiently tame to be driven by an average consumer? We needed to find out.

Meet SF subscriber Harald Steiner, native of Australia, resident of Tokyo. Steiner has a passion: To be able to watch Australian television from his Japanese home. His target is Palapa B2P's Australia Television International (ATVI) and Gold Net. Steiner, like many people in Europe, suffers from the midget dish ailment; he is restricted to a 1.2m (solid) reflector. B2P was never intended to serve Japan and Steiner's restrictions that prevent him from having a "decent size dish" force him to constantly search for

electronics means of upgrading his picture quality. He does the usual things: Pays

big money for a 17 degree Cal Amp LNB, buys the best Superfeed he can locate, and then he begins that endless trek down the aisleway of ultimate receivers.

Now here's a surprise. The Palcom receivers are designed and manufactured in Japan. They are not sold in Japan. Not at any price. They are an export item. That seems like a rule designed to be broken to SF and with the assistance of Palcom Europe's Rainer Pitwon SF prevails upon the Japanese company to provide Harald Steiner with a loaner receiver; one that he could "test," following instructions from SF. We believe that if enthusiast Steiner can take the receiver from the carton, hook it up, and make it play better than the receivers he has assembled for comparison, we have a real world test sequence to report to you. SF can test and evaluate all we want but the real proof of the value of the SL-7900RP (and the SL-8000RP) is going to be



Australian Steiner at home in Tokyo with loaner 7900

proven in thousands of apartments just like Harald Steiner's.

Weak Signal Performance

Steiner's predicament is a microcosm of all of the reception "problems" that plague the entire Pacific basin; weak signals. Unlike our European or American cousins, we don't have a selection of 48-52 dBw Ku footprints raining down on our toy dishes. Out here we think a 3m dish is tiny (although our overly zealous local councils and sometimes our neighbours may not agree on this). For those fortunate enough to have larger dishes, there is always "another satellite" buried down in the noise that is crying for an even larger dish or a more sensitive receiver. And if antenna size is not restricted, there are those American Domsat birds to our east which the University of Auckland 7.3m dish has proven to us are viewable (see SF #6, p.2). Steiner would kill for a 7.3m dish.

You cannot have a dish that is too big. You possibly cannot afford a dish that is too big. And you probably don't have the room (or the co-operation of your neighbours or authorities) to install a dish that is "too big." That leaves you with one choice: A dish that is "too small," and a receiver that is the best you can afford. If this describes you, Palcom believes you are its target buyer. For each 7.3m dish like the University of Auckland, there are thousands - nay tens of thousands- of Harald Steiners struggling along with toy dishes on apartment house balconies.

TED / Threshold Extension Demodulator

Palcom won't tell us how they build a receiver with threshold extension. They also won't tell us how they can claim a 3dB threshold in a world where most receivers bump along with a 6 to 7 dB threshold. SF has an enquiring mind: We wanted to know and asked Rainer Pitwon. He responded:

"Most so-called low threshold tuner circuits rely entirely on a combination of narrow filtering (which typically leads to unacceptable truncation of the colour information and a general 'flatness' of the

picture display). Palcom uses what our engineers call a 'dynamic approach' wherein narrow filtering is coupled with software processing. Some amount of colour truncation is inevitable, but the software dynamics produces a significant improvement in picture stability and 'depth' to the image than other low threshold circuits. Ultimately, the characteristics of the actual incoming transmitted signal determines just how effective our approach to TED will be."

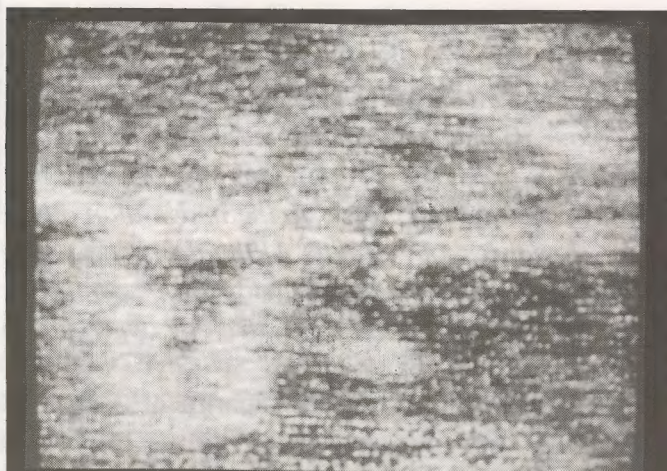
In Harald Steiner's Tokyo apartment, truncated colour (if present) is acceptable. With a 1.2m dish as his ears, he will settle for viewable pictures and listenable sound on those satellites and transponders which nominally are not even showing on the screen with conventional receivers.

Steiner decides to compare reception on his SL-7900RP loaner unit against the best two receivers he has previously found for his particular installation. One is an Echostar LT530 Low Threshold, the other is the work horse of the Pacific, a Winersat WR3100D equipped with 18 and 27 MHz IF bandwidths.

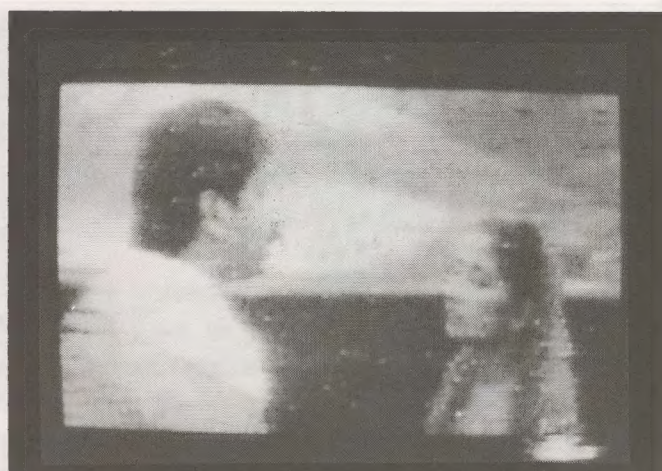
Steiner is dogged in his testing. Each satellite he can receive (more than a dozen C and Ku) and every transponder is checked with all three receivers. It takes days of checking, note writing, and re-checking. He loves every moment of the exercise, helped no doubt by the favourable results. At SF's request he shoots a couple of rolls of film from the off-screen results and supplies us with a heavily laden envelope of prints.

He observes:

"The 7900 is able to turn non viewable pictures on the Winersat (operated in its 18 MHz bandwidth, which is the most sensitive position) into viewable pictures. There is a big difference (in favour of the SL-7900RP) in the ability to resolve weak signals here (such as SUN TV on Rimsat G1). The difference between the LT530 and the 7900 is closer but the photos show that the video from the 7900 is better by a noticeable amount. In particular, while the LT530 might produce a picture which has a very similar amount of sparklie noise to the 7900, what the photos do not show is that the picture on these weak signals jitters and bounces on the 530 whereas it is stable and jitter free on the 7900. Equally important, perhaps more so, the audio on weak signals on the 530 is simply not present whereas on the 7900 it is not only present but enjoyable. The photos also do not show that on noisy reception, the



RAJ-TV through Winersat WR3100 (18 MHz b/w)



RAJ-TV through Echostar LTE530



RAJ-TV through Palcom 7900; TED position 1



RAJ-TV through Palcom 7900; TED position 24

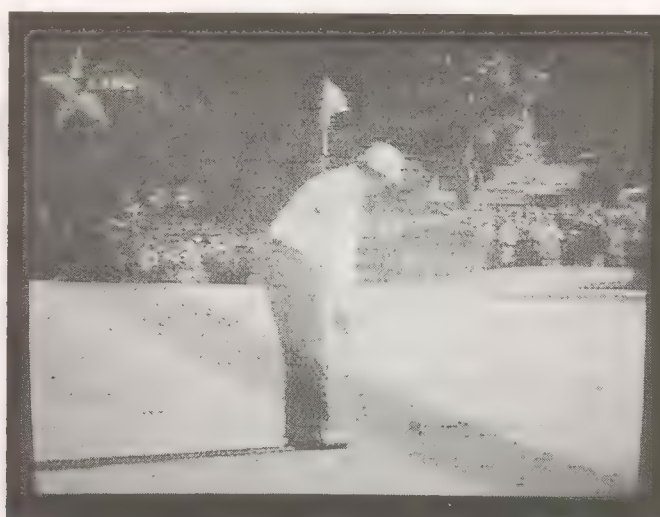
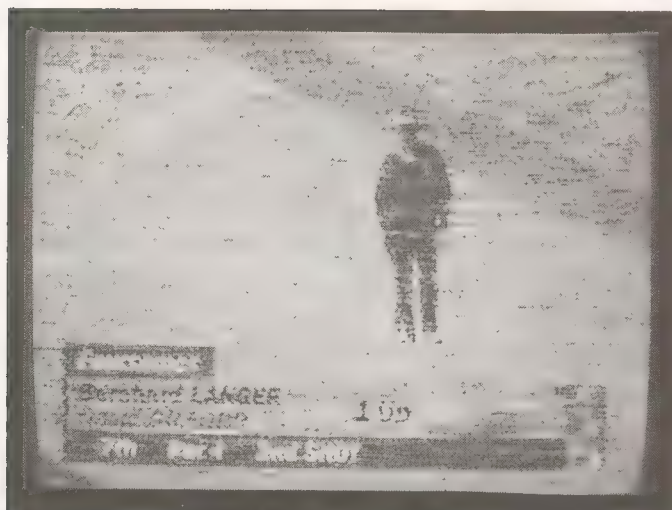
saturated colours (solid reds and blues) has more truncation (disruption of the colour image) on the 530 than the 7900."

Indeed. At the opposite end of the signal spectrum are those powerhouse signals which are so strongly painted on the screen that you imagine you could reach out and touch the display in real life. How does the 7900 work under this circumstance? Steiner again:

"There are 32 TED steps with the 7900 plus a normal (full) bandwidth and a narrow bandwidth processing system. In operation, the weaker the signal, the greater the TED required. A really strong signal looks and sounds best in wide bandwidth (27 MHz), a slightly impaired signal cleans up fine in the 'narrow'. This is like most receivers with two-position bandwidth selection. TED starts at 1 (minimum amount of extension) and proceeds in user (remote control button pushing) steps to 32. Signals that are moderately weak tend to clean up by TED 10 to 12. Very weak signals go the limit to TED 28-32."

SF found that really strong signals (RAJ and EMTV, for example) were best in wide, slightly impaired (in terms of overall quality) in narrow and then went down hill rapidly as we climbed into the TED mode. Palcom has thought this one out; for each transponder on each satellite there will be one "best" setting of the controls. The 7900 (and the 8000) provide you with memory: Once you have determined the best setting for each transponder, execute the settings you have selected into memory. Now each time you return to a particular transponder the memorised settings are automatically selected.

The NHK signal on PAS-2 was selected as a challenge by SF because it is not always the easiest transmission to clean up. The signal is strong enough (in the South Pacific with a 3m or larger dish) but even when strong enough there are imaging and sound problems. A number of SF readers have complained that the sound has a tendency to "crackle" on words with "s" at the end. And the video may have some built-in jitter. Different receivers produce different results; as Rainer Pitwon says, *"The characteristics of the incoming signal determine how effective (any) receiver will be."* The 7900 in our SF tests did not produce the best NHK



Pitwon: "The characteristics of the incoming signal determine how effective (a) receiver will be." Here, on STAR Sports, Winersat (18 MHz b/w, left), Palcom 7900 (TED28, right) suggests not all improvements are dramatic.

pictures; a Drake commercial receiver (model ESR 1252) had the cleanest (studio quality) video of the NHK test pattern. But, the Drake receiver also cracked on words with "s" while the 7900 did not. On other strong PAS-2 analogue signals (CNN, ANBC et al) the 7900 was as good or better in imagery than the considerably more expensive ESR 1252 and always better in the audio department. An aside: The NHK "s" crackling sound for reasons not yet understood is most pronounced on Sony TV sets according to readers. Those installing dish systems for NHK viewers are warned to avoid Sony TV sets, or, to select a satellite receiver that handles this interesting audio artefact with a minimum of user discomfort.

User Friendly

To an enthusiast like Harald Steiner, all of those wonderful remote control commands and the on screen receiver programming menus and prompts are both an interesting challenge and a source of operational joy. The average consumer (which Steiner is not) may not be so enamoured by the multitude of decisions required to work your way through the set-up options. A dealer selling the 7900 or 8000 will be well advised to learn how to "drive" the receiver before he gets to the consumer's home. It takes some time and patience to be fully rewarding and you are strongly urged to learn to operate it in your own shop before you are under the stress of being in the customer's living room with the entire consumer family looking over your shoulder. Simply set it up for them, and once set they can change transponders (and satellites) without fear or having to learn how to set it up themselves. This receiver has so many programming options (LNB selection, audio selection, actuator control selections and much more)

that a typical consumer would find it quite overwhelming. A smart dealer will insulate the consumer from these decisions by preprogramming.

Bottom line? Harald Steiner asked Palcom Japan to change their policy to allow him to buy his test receiver, even though he lives in Japan where they are not sold. And that says heaps about the 7900. Next month: Picture in a picture.

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THE POLARISATION GAME

Fooling The Signals

A circular polarised signal can be visualised as a continuously wound corkscrew. Whether it winds clockwise or counter clockwise determines the sense (right or left) of the circular mode.

In terrestrial applications employing circular waveforms, the transmit and receive antennas basically look like corkscrews. They are called helix antennas; a helix is a spiral or coiled curve (like a watch spring). Ideally, a satellite feed for circular would also have the physical shape of a spiral.

A helix antenna at 4 GHz would be a very tightly wound, tiny spring; more akin to a jeweler's art than an antenna device. People have attempted to build helical satellite antennas for 4 GHz with modest (or poor) results since helices like their VHF - UHF counterpart the yagi are at best too low on gain at 4 GHz to compete favourably with even a small parabolic antenna.

Still, at the feedpoint in a 4 GHz reception system, optimised recovery of a circular wavefront signal does require a feed that at least thinks it is circular. Or, can convert the incoming circular wave into the standard linear form which we see represented by the probe inside of the LNB WR-229 waveguide "mouth" of the low noise block downconverter unit.

After considerable trial and error by early designers of Intelsat 4 GHz receive systems, all attempts to actually manufacture a true circular feed probe system were abandoned as a bad exercise. In place of this effort came a new approach: Perhaps the easiest way of dealing with circular signals was to mechanically convert them to linear signals as they enter the mouth of the feed antenna. In other words, if you can't deal with them in their circular format, change them to something you can handle.

In the world of microwaves, this is called "creating interference patterns." Recall that our feed is a combination of elements:

1) A section of circular (round) waveguide, sized for the 4 GHz wavelength, and,

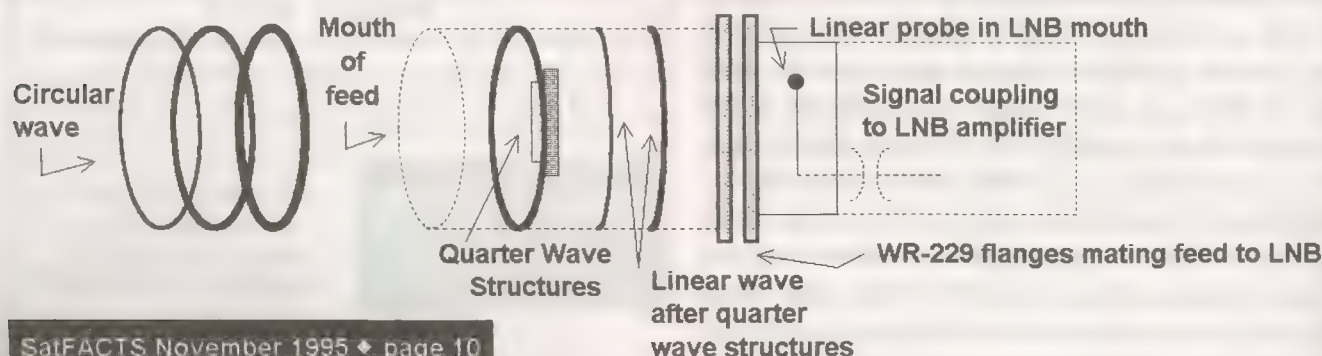
2) A "loading (scalar) ring" added to the front mouth of the waveguide section, for purposes of modifying the beamwidth of the round waveguide open ended tube-antenna, and,

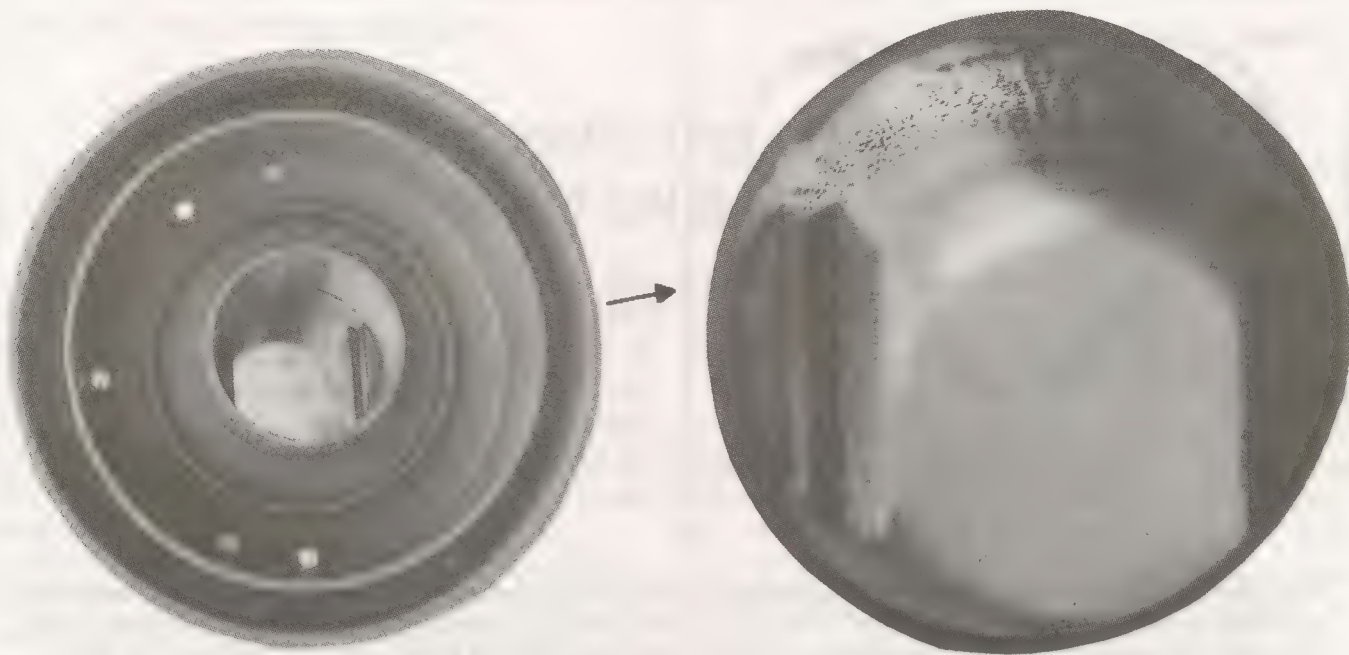
3) A "seamless tube" (pathway) for the captured microwave signals to follow as they travel down the inner surface of the tube to the waiting LNB ("antenna") probe at the end.

"Seamless" is vital; anything placed inside of the tubular waveguide section will "interfere" with the flow of signal along the inner walls of the waveguide. A hornet or wasp's nest is an example of something you do not want inside of the feed "mouth."

On the other hand, if you were to place an object of the correct size in a precise position inside of the feed mouth, you could also cause the waveform entering the mouth to change. An example: Take a garden hose and adjust the nozzle for a thin projection of water at maximum pressure. Now point the hose at a rock or something solid and watch carefully what happens when the water strikes the near edge of the object. Some of the water bounces upwards and literally re-sprays in a new direction away from (or back into) the jet coming from the nozzle of the hose. You might say the rock is "interfering" with the stream of nozzle water and creating a new stream of water.

Microwave engineers routinely "interfere" with the incoming circular waveform. They do this by adding bumps and/or ridges inside of the waveguide; sometimes called "quarter wave structures." These bumps are raised projections on the inside of the otherwise smooth, seamless, waveguide ("rocks" as it were). If you are a microwave waveguide and antenna engineer, you can properly design the shape, size and position of these "quarter wave structures" to cause the incoming circular waveform to reform at and beyond the "bumps" into a





"Quarter wave structures" (rocks) are a structural part of this (Av-Comm) F1700 feed. Structures "interfere" with the incoming circular waveform, and the "spill" over them reforms as a linear wave front which is then compatible with the probe (antenna) located inside the mouth of the LNB WR-229 waveguide flange.

normal linear polarised wave. Yes, microwave engineering is akin to black magic.

Photos here show "rocks" built into the otherwise seamless inner diameter of the waveguide portion of the feed. As you might well imagine, there are right and wrong ways to do this; actually there is one right way and infinite wrong ways. And correspondingly, any feed you purchase with "rocks" built into the inner surface of the round waveguide portion will work well, poorly or not at all depending upon the skills of the original designer as well as the craftsmanship of the fabricator of the feed.

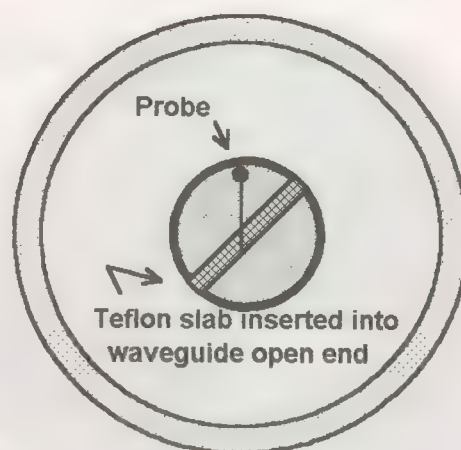
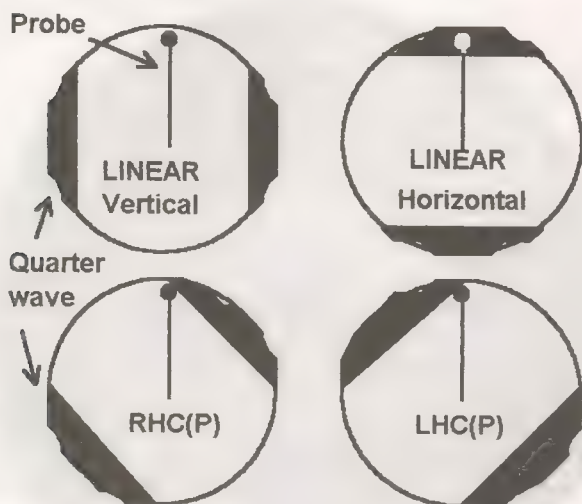
There are other methods of converting circular waveforms to linear. One popular method is to insert something into the waveguide; something of the correct size, shape and electrical conductivity to force the circular waveform to become a linear waveform. Chaparral sells a "Dielectric Plate" (part #0216) which is intended for this purpose; ADL has a similar device (three models depending upon the feed it will be used with; OP-510, OP-515 and OP-520). Dielectric plates, often made of Teflon or some other highly insulating material, act like rocks that disrupt the flow of water in our hose nozzle experiment.

A feed with "rocks" built-in has an advantage that Dielectric Plates do not have; the designer and manufacturer are in control of the precise location of the rocks. The Dielectric Plates, on the other hand, are placed into position by the antenna installer, can easily be mis-located in both their location and the depth within the feed they are placed, and with these variables there is often less than ideal results.

There is another problem with placing either raised bumps or Dielectric Plates into the circular portion of the waveguide feed. Linear signals, as opposed to circular signals, see these objects as impediments to their "seamless flow" down the inner surface of the waveguide to the feed probe on the LNB at the end of the waveguide. In other words, they can (and usually do) cause loss of signal for linear reception even if they have been properly sized and positioned for conversion of the circular signal to a linear format. Therefore almost without exception, any feed that has had quarter wave structures or a Dielectric Plate installed for optimised circular reception is going to give up something (that something being signal level) for the reception of linear signals through the same feed.

Thus there is a trade off when you adapt a feed designed for linear reception to also be functional for circular reception. Usually the bigger loser is the linear reception, assuming that the raised bumps or Dielectric Plate are precisely shaped, sized and positioned for the circular conversion. If, on the other hand, the bumps or plate are improperly sized or positioned, you will not only lose linear reception signal levels but you will also find the improvement in circular levels is lower than you had anticipated.

By how much? Adding bumps or a plate to a round waveguide feed seldom does better than costing you between 1.5 and 2 dB in linear signal levels. That translates to your 3m dish becoming as effective as a 2.4m antenna (at C-band). This may be a big price to pay



Four views of quarter wave structures (left) showing adjustments of waveguide feed for each of four separate polarisation modes. "Probe" is "antenna" either in back end of feed or appearing in WR-229 waveguide flange on LNB. On right, a linear feed adapted to circular by inserting purpose sized Teflon "slab" into open (front) end of waveguide "mouth." Surrounding the mouth, larger circles represent "scalar rings" placed on feed to match f/D of particular antenna in use. Slab is shown in position for LHC(P); can you see the similarity to the quarter wave structure alignment for LHC(P)? Left, quarter wave sections are at 45 degree (slanted) angles for both linear polarisations, thus creating additional losses for these modes and must be physically rotated "out of the way" when trying to receive linear signals. Likewise, in Teflon slab adapter, it is "in the way" of linear signals and destroys feed efficiency if left in the mouth when trying for optimum reception from linear signals.

to convert a 3m dish to circular polarisation. If the bumps are wrongly sized or positioned, if the plate is improperly installed (very easy to do wrong, tough to do right), the loss could be much more significant. One of the most difficult installations to get "right" is a Chaparral Polarotor type of feed modified with a Dielectric Plate.

Switchable Circular

In a linear polarisation world, you have two sets of polarisation to deal with: One is vertical and one is horizontal, and as they come into your feed they are always 90 degrees in phase apart (i.e., vertical looks like the hands on your clock at 6 o'clock, horizontal looks similar to 2:45). As we saw in SF#14, a small servo motor rotates a supplemental feed probe (antenna) inside of the round waveguide to select whether your feed is responding to 6 or 2:45 signals.

Adding bumps inside of the waveguide inner surface, or shoving a Dielectric Plate into the mouth of the feed waveguide forces circular waves to become linear waves. If the bumps or plate are perfectly proportioned and perfectly positioned, you will get 3dB more signal on circular with them than you will without them. That is the same as switching from a 2.2m dish to a 3m dish. Unfortunately, the bumps or plate position will be correct only for (either) right hand circular, or, left hand circular polarisation. Just as a linear feed probe must be rotated by the servo motor to accomplish selection

between vertical and horizontal, so too must the position of the bumps or plate be moved to select between RHC (right hand circular) and LHC (left hand circular). Rimsat is LHC, Intelsats are RHC (and to a very limited degree, they also use LHC in the Pacific). Therefore, setting up with dish feed bumps or plate for EMTV (on Rimsat G2) is just the opposite from setting up for WorldNet (RHC) on I180. A feed optimised for EMTV will have virtually no reception from WorldNet, just as a feed adjusted for PAS-2 ANBC (vertical) will have no reception from CNN (horizontal).

In the linear only feeds, one rotates the probe to switch from a probe position of 6 o'clock to one near 2:45. Rotating the probe with a servo motor is one thing, rotating the quarter wave structures moulded into the inner surface of the waveguide or physically moving the Dielectric Plate from one position to another from inside at the satellite receiver is quite a different challenge.

Most installers think of polarisation "matching" as primarily a matter of extracting maximum signal from the dish surface and sending it into the LNB. With relatively small margins of error (between a properly running dish system and one that is mis-adjusted), even a fraction of a dB of unnecessary loss can be disastrous. Equally, having even a small component of "wrong polarisation" getting into the LNB can be a significant problem since "wrong polarity" signals appear as noise in the desired signal. A good installer knows this and is very careful when installing feeds (continues SF#17).

UNDERSTANDING THE NARROWBAND SIGNALS ON SATELLITE

Nau FM is a commercial radio station found on an audio subcarrier of 6.8 MHz as a part of the EMTV transmission (G2, IF 1265). In a major city such as Sydney or Auckland, the production qualities and level of professionalism heard on NAU FM might not qualify it as a serious commercial competitor. In areas of the Pacific with few or no commercial FM, Nau's format could be a significant service to a community (1).

Audio subcarriers are inexpensive methods of carrying narrowband (non-television) programme material over great distances. The audio subcarrier is typically not related in programme content to the television programme with which it is "hitching a free ride." At the uplink, adding an audio subcarrier costs relatively little (typically less than US\$2,500) and the available transponder power proportioned such that both the TV programme (with its own audio subcarrier) and the extra (Nau FM example) subcarrier seldom costs the TV signal more than a few percentage points. Many uplink operators routinely install subcarrier equipment and then rent or lease out this subcarrier space to unrelated third parties which, like Nau FM, use the transmission coverage of the satellite service to reach far beyond their normal marketing regions.

In the United States and Europe, it is not uncommon to have as many as 10 unrelated (to video) audio subcarriers hitching a ride with the primary TV video and its own audio subcarrier. In theory, each of these narrowband audio subcarrier operators has its own "niche market" which it is addressing, and on the ground home dish owners and others use these aural subcarrier hitch hikers just as they would any terrestrially delivered audio (only) service.

Any satellite receiver with variable audio subcarrier tuning can be pressed into service for this reception. And, TVRO receivers equipped with two separate audio subcarrier tuners (on the theory that it takes two for full recovery of stereo TV audio transmissions through satellite) can be divided in duty; one of the FM audio tuners handles the TV programme audio while the second is left full-time tuned to the selected audio subcarrier service. In the case of EMTV, tuner number one is adjusted to approximately 6.25 MHz while tuner two is adjusted to 6.8 MHz. From the (RCA) jacks on the rear of the receiver, separate audio lines go to the equipment that follows: The TV programme audio to the TV modulator or audio input on the monitor, the extra

audio output to perhaps a sound system in a restaurant, front office of a hotel or motel, or simply the hi-fi sound system of the consumer.

Audio subcarriers are traditionally modulated with the same "format" as TV programme audio; FM (frequency modulated) to a standard deviation (width) that approximates TV audio. But there is no real "standard" here, except the de facto 200 KHz. De facto 200 KHz audio is adequate but many programmers consider it an improper choice given several variations available. In SF#14 we mentioned one of these optional audio formats known as "Panda."

STAR TV (AsiaSat 1, to be on AsiaSat 2 shortly) is a corporate believer in the benefits of Panda audio. If you are acquainted with consumer audio systems, you are familiar with various techniques designed to reduce background noise (under such trademarked names as Dolby). Panda is such a system with an added wrinkle; compression.

An audio channel, like a video channel, requires a certain minimum amount of bandwidth to faithfully reproduce all of the audio range at the receiver. This is the de facto 200 KHz bandwidth most TV audio programme subcarriers utilise. However, if the audio programme material is "compressed" electronically, a somewhat smaller bandwidth may be utilised with a savings in both spectrum space and transmission power used by the audio subcarriers. Accordingly, STAR TV has adopted Panda "1" (there are several variations of Panda's patented technique) which employs both noise reduction and compression.

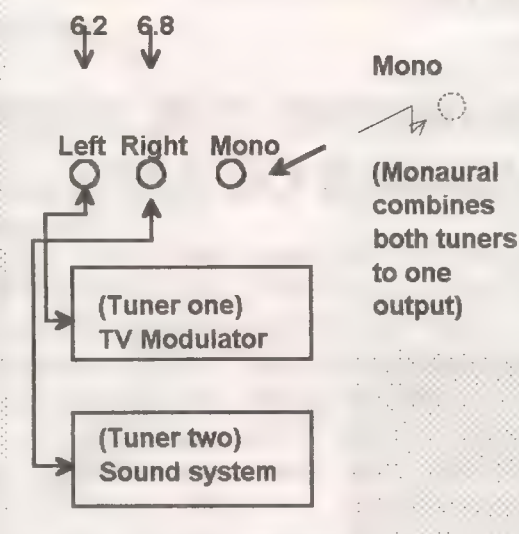
A signal that uses compression requires a receiver that counters the compression using a circuit known as an "expander." A TVRO receiver tuning in a Panda format audio channel without Panda expansion built in receives what is best described as "muddy audio"; the sounds seem blurred, indistinct. The sound is all there, but it sounds "confined." That is why Pace and other receivers sold for the AsiaSat STAR TV services include Panda 1 audio circuitry.

Another variable in audio treatment involves something called pre-emphasis. In any audio system, a

1/ Various low cost methods of distributing satellite received audio services in a "neighbourhood" or small community will be explored in SF#16.

✓ Check List for Audio

- Is the receiver set to the correct de-emphasis to match the transmission format?
- Is the receiver set to the best (sounding) audio bandwidth to match the received signal (strength)?
- Is the transmission format compressed? If yes, the receiver must include a decompressor circuit.
- Are you tuned to the centre of the audio subcarrier transmission frequency? Being off just a little (i.e., 6.25 when it should be 6.20) can make a BIG difference!



Audio Criteria

Outputs typically in RCA jacks and also within SCART plugs on middle and top end receivers.

Output impedance of 600 ohms (nominal) will not directly connect to a speaker (typically 4-8 ohms); additionally, audio output level is too low to drive speaker.

Some headphones will work directly from monaural jack.

majority of the real power in the sound is confined to the lower segment of the audio spectrum. A typical human can hear (detect) sounds from a low audio frequency near 50 hertz to a high of around 15,000 hertz (15 KHz). Our hearing is not linear, being more sensitive to weak sounds in the under 3,000 hertz region than above. To compensate for this, audio programme material is artificially enhanced (the volume is increased) in the higher audio frequency ranges (typically above 5,000-6,000 hertz). In this way a flute (high frequency notes) can sound as loud as a bass violin (low frequency

sounds). Without pre-emphasis, the flute is lost in the overpowering sounds of the bass violin.

At the receiver the pre-emphasis of the audio processing system at the uplink is reversed to return the sounds coming out of the speaker to something approaching the original sound levels. This requires a circuit that de-emphasises the pre-emphasised sounds transmitted. De-emphasis is available in varying degrees (to match varying amounts of pre-emphasis) and the "standard" de-emphasis is something called J17. Others commonly found are 50 uS (microseconds) and many middle and upper (price) end receivers offer user selection of de-emphasis circuits (2).

Variations in the Panda approach have been selected by some receiver manufacturers and uplink operators; "Wegener" audio is one of these and is widely utilised. Any non-standard audio requires some form of special subcarrier tuner audio circuitry to properly recover the audio.

For receivers equipped with variable audio bandwidth, there is no single "correct setting" for a given transponder subcarrier frequency. By reducing (narrowing) the audio bandwidth, the receiver reduces the background noise present on weaker signals. At the same time the audio fidelity is being reduced as well. Thus the adjustment of "width" is a compromise if the signal is not strong enough to be noise free in the widest bandwidth available to you. Always start with it "wide" and then tune the width narrower and narrower until either the noise disappears, or, the sound begins to sound restricted. If the sound is still noisy in the narrowest bandwidth available, your picture is probably suffering from the same "weak signal" problem.

SF#16: Neighbourhood sharing of satellite audio.

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2/ Some receivers such as the Palcom SL-7900RP also offer their own internal audio processing circuitry; the 7900 hi-fi 1600 is an example of this.

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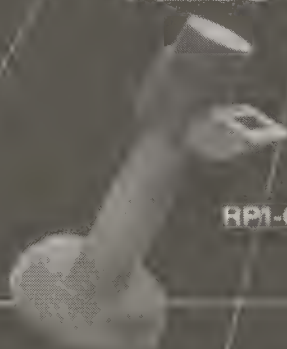


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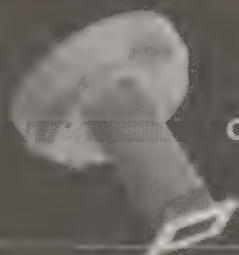
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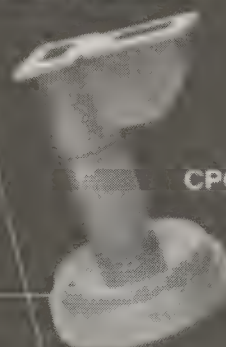
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DISH MOUNTING BASICS

Finding True North

SF#14 looked at the mechanics of the mounting pole for satellite dishes. While it is possible to correct for a non-vertical pole, most installations will go far more quickly and with better arc tracking results when the pole is straight up and down.

The dish polar mount technique makes use of several geometric norms; standards you can count on to be the same from installation to installation. The trueness of the vertical support pipe (i.e., that it leans not east, west, north or south) is one of those "standards" which you count on when truing the arc tracking of a polar mounted dish.

True north has a standard meaning. For anyone in the Pacific, true north is not magnetic north. A compass tells us with only minimal accuracy where we are on earth relative to the (true) north pole. The pole itself is known rather precisely by its own geographic co-ordinates:

76.11 north and 100.28 west

The actual North Pole is located at 90.0 north, so as you can visualise the magnetic pole (located within Bathurst Island, Canada) is positioned quite some distance to the "south" as well as being "downhill" from the top of the world.

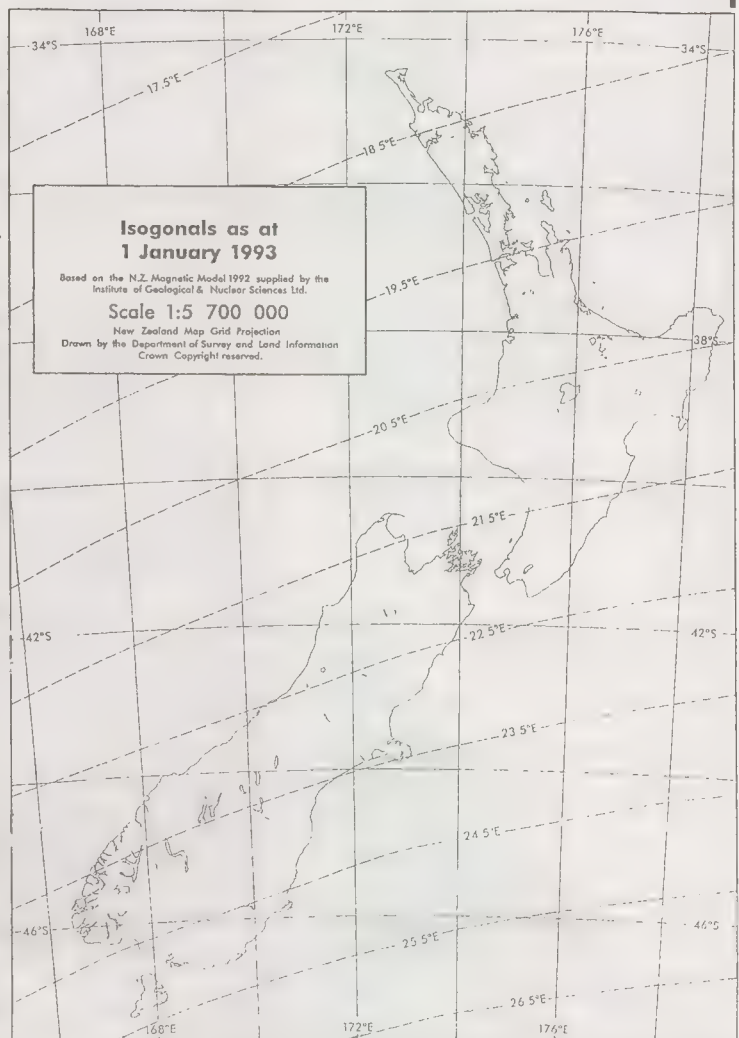
A compass needle tells you where you are relative to Bathurst Island; it does not tell you where you are relative to the top of the earth (90 degrees north); not directly, anyhow.

To further complicate matters, the magnetic pole is moving a little bit each year and the co-ordinates given above are now 20 years old. If mankind survives long enough, the north magnetic pole will eventually be located where Chicago, Illinois is presently found.

Some people depend totally on their compass readings; sailors without electronics, trampers in the wild without a cellphone, satellite installers with a polar mount.

One of the first steps to be done with any polar mount tracking system is to locate true north. On a dark, clear night with some training you can do this by reading the stars. Most satellite dishes are installed in the daytime and you may not have the time to hang around waiting for clear skies anyhow.

The compass is the instrument of choice. The technique is quite simple: you apply a correction factor



based upon where you are against where the magnetic north pole is located. The correction factor turns magnetic north from an absolute indication of north (something it never was to begin with) to a reference point from which you can then calculate true north.

Any agency that has reason to rely upon compass headings knows the correction factor for your portion of the world. A telephone call from you to the nearest airport control tower, for example, or to a local civil engineer (land surveyor) will obtain the "correction factor" for your spot on earth.

In the example shown here (courtesy New Zealand Department of Survey and Land Information; note date of 1 January 1993) the dashed line tells us that any compass reading taken in or about Auckland (NZ) will indicate an error of 19.5 degrees from true (or "grid") north. Note that the dashed lines marking 1 degree step correction latitudes do not flow precisely east by west. Because the magnetic pole is south of the true north pole

FINDING THE BIRDS: Arc Set by Gourmet Entertainment

Books have been written to explain the "mechanics" of the geo-stationary (Clarke) orbit belt. People entering the industry, or brushing up on their fundamentals, have paid hundreds of dollars to attend special seminars that teach this often confusing aspect of installing satellite dish receiving systems. A novice entering our field has plenty of reason to be sceptical: The sky is big, the satellite is very small, and the satellite dish has a pencil thin beam. Old timers have been known to advise new comers,

"It's a little bit like finding a needle in a haystack."

I will tell you a true story. The first satellite dish I ever installed was in 1976, a 6 metre monster in my side yard in Oklahoma (USA). I engaged some assistance not only because it was big and heavy (over 2 tonnes!), but also because I wasn't certain of my ability to locate the satellite. We worked for two days putting the dish together and with the help of a lift hoist manhandled it onto its steel mount. Dusk was rapidly falling on day two and I hoped we might somehow find the satellite before it was too dim to continue working.

"We'll have pictures in five minutes," announced Maynard Weathers as he climbed a ladder to bolt the LNA (this was before LNBS) onto a makeshift horn feed. I was very dubious because at this point we had not even begun the exercise of adjusting the dish elevation or azimuth. Climbing down from the ladder, Weathers went behind the dish and hand cranked first the elevation and then the azimuth moving the dish slowly to a new position in the sky. He had no compass, no inclinometer. In fact he had no measuring tools at all. I did notice as he walked back to the front of the dish he stopped to eyeball the rim of the dish against the rising moon. Then he looked at his watch, went back behind the dish and turned the azimuth another half degree or so west.

"Turn it on," he instructed, pointing at the satellite receiver and cable connected TV monitor. "Tune to 3990," he added. As the TV set warmed up sound came from the speaker and a picture appeared on the screen. It was a newscast from Vancouver (British Columbia) via ANIK 1 satellite. In 1976 there were only three satellites serving North America. It was not as if you could stumble across one while wandering about the heavens. Weathers was dead on when we turned

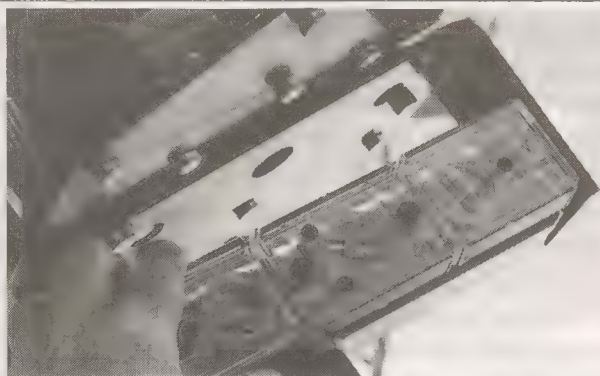
on the equipment without as much as a compass. In nineteen years in this business and hundreds of dish turn ons, I have never seen this trick repeated.

Jim Roberts could do it. He's the creator, the guru, the innovative spark for Gourmet Entertainment. He builds the tools to help you find satellites if you are not blessed with a Maynard Weathers divining rod buried under your skullcap.

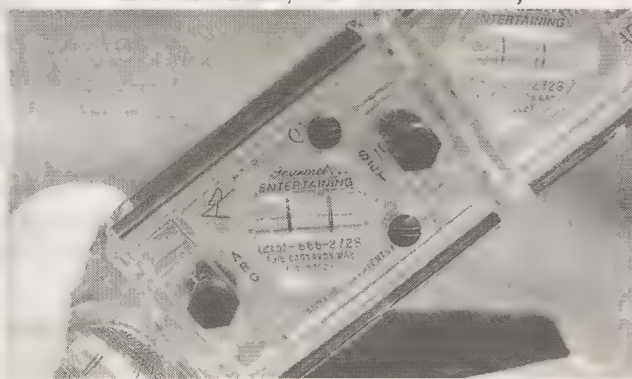
Roberts' Arc-Set is an extraordinary tool. It looks like a miniature builder's level with three bubbles. Three bubbles, three steps to a perfectly tracking dish. Like many great concepts, Arc-Set reduces the challenge of finding the satellite belt and making your polar mount dish track the satellite belt to its least complicated basics. Roberts strips away all of the mathematics, the hard to use angle finders and dish mechanics and reduces the world to three steps, each with the assistance of a dedicated carpenter's level bubble:

- 1) Adjust/set the incline axis for your location (use bubble one)
- 2) Pointing the dish straight north (no matter whether a satellite is due north of you or not), use bubble two and adjust for the "zenith" (highest look) angle
- 3) Rotate the dish towards the western horizon to as near to your horizon as you can see an active satellite; use bubble three to adjust the dish for the "extreme" (lowest elevation) satellite. Then, in the best tradition of Maynard Weathers, turn on the receiver and sweep the dish back to due north. All along the way, as if by magic, you will find all the satellites that are supposed to be there.

Arc-Set is a tool customised to each location. Roberts (or his authorised distributor) pre-sets your Arc-Set to your geographic co-ordinates before shipping. The tool can be used for an 80 kilometre radius of your home co-ordinates with accuracy. It has magnetic strips on two sides to allow you to place it on the appropriate dish surface and leave it there as you use your two hands to make the adjustments while observing the bubbles. It is rugged, does not run on batteries, and will not wear out. Plus, it is reasonably priced. And the written instructions are written for first timers. You can use it without understanding a single thing about the Clarke Orbit belt, and get perfect results every time. You may never be a Maynard Weathers, but with Arc-Set you can fool most people into believing you are divinely endowed.



Magnetic strips on both straight edges "stick" Arc-Set to the steel dish surface. Bubbles guide you to perfect dish install. (Gourmet Entertaining, 3915 Carnation Way, Los Angeles, Ca. 90027; tel 213-666-2728, Fax 213-666-2442)



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 - ♦ SPACE individual (home DTH) members: US\$50 per year in NZ, 3 year minimum outside of NZ. Commercial rates for motels, SMATV, cable upon request.
- NOTE:** Requires SA D9222 IRD with dish typically 2.4 to 3m. IRDs available through SPACE Dealer Members & Telsat Communications.

SPACE PACIFIC PROGRAMMING: Ph. 64-9-406-1282
Fax: 64-9-406-1083 • POB 30, Mangonui, Northland, NZ

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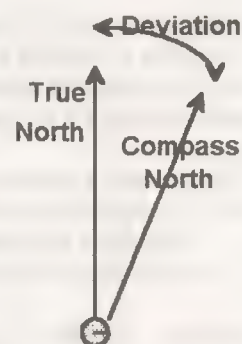
Postcode: _____

Phone: () _____

and the world is basically round, there is an east-west slippage of the correction factor as well as a north by south element.

Magnetic north slippage, to our east, is on average at a rate of approximately 0.5 degrees every 7 years. Thus for precision work (possibly greater than you require for most polar mount installations) the 1993 date on the correction

factors shown on the map on page 18 would be updated by .14 degree. However, by 2000, the correction to this map will be 0.5 degrees (i.e., in Auckland your compass reading will indicate a point 20.0 degrees east of true north).



Magnetic north is east of true north by some known amount

Why True North?

Why do you find and need to know true north when setting up a satellite dish? Because with polar mount mechanics, the geometry of the arc tracking depends upon your making certain adjustments to the dish when it is pointing directly north. From your location your dish will have its greatest (highest) elevation angle when looking at the Clarke satellite belt due north of the dish location. If, for example, you erred and used magnetic north for making these initial set up adjustments to the dish, the dish polar mount tracking would erroneously believe the belt was shifted east of your actual location by approximately the correction factor. Tracking of the satellite belt starts from the premise that a satellite true-due-north of you will be at a specific elevation above your horizon. You point the dish true-due-north and adjust the dish mechanics to point "up" (elevation angle) by the computer or hand calculated elevation angle for your latitude. If you are fortunate enough to have a satellite that is true-due-north of your location (Picton, NZ for example has I174 true-due-north; Swan Hill, NSW and Windorah, Qld. have Rimsat G2 true-due-north), you can reassure yourself that your elevation adjustment is dead-on by simply rotating the dish on the mounting pole until it is pointing true-due-north and then adjusting the elevation settings on the dish set up until you have the satellite true-due-north peaked up in level.

Now, if the declination offset adjustment has been set properly, that is about all there is to putting in an arc tracking dish at Picton or Swan Hill or Windorah. For the rest of us there are a couple of remaining steps to be performed (see Arc-Set Report, page 19 here).

Declination offset? Come back to SF#16 in December.

SOUTH PACIFIC REGION SATELLITE & CABLE SHOW

How The Programme Is Shaping Up

**TUESDAY
JANUARY
23**

Antenna Set Up Day

Commercial antenna suppliers will be setting up a variety of dishes from 3.7 metres diameter down to small 60cm Ku band dishes. Each antenna assembly project is a "Mini-Course" in antenna procedures, from packing carton to arc-tracking. Suppliers will individually announce (SatFACTS December) their plans for specific "Course Enrolment" for those who wish to be present for the entire antenna procedure. Registration packets (badges, full Seminar schedules) will be available in foyer adjacent to "antenna lot" from 1PM to 6PM. For those staying at Barrycourt Motor Inn, TV in-room course schedule will operate from 8PM to approximately 11PM, other hours posted in SPRSCS programme schedule for January 24-25-26..

**WEDNESDAY
JANUARY
24**

All Day Seminar: Satellite TV Basics

A strange, new world is unravelled. A world with its own 'language', techniques, equipment. Course leaders Mark Long (Bangkok based author of best sellers "The World of Satellite TV," "The Asia-Pacific Satellite Directory" and many more), Selwyn Cathcart (Telsat Communications, New Zealand's oldest TVRO equipment distributor) and Bob Cooper explore and explain how the satellite delivery system functions, how the various parts work (reflector, feed, LNB, actuator, dish controller, receiver, signal processors). Sessions from 10AM to 12 noon and 1:30PM to 4:30PM. Exhibit halls open 12N to 1:30 PM, 4:30 - 6:30PM. Lunch available on premises, tours 4:30-6PM of University of Auckland 7.3m antenna system.

**THURSDAY
JANUARY
25**

First Full Day of Advanced Seminar Courses (*)

10AM: Welcome and Brief History of Satellite TV In Pacific (joint session)
10:20AM: Pacific Satellites: Present and Future (joint session)

Advanced Systems/Technical

11:05AM: Status Report - MPEG DVB Compliant Receivers
1:30PM: Dish Selection Criteria / 2:25PM: Feed Selection Criteria
3:15PM: Test Equipment and Its Use / 4PM Dish Tracking Techniques

Business Management Opportunities

11:05AM: Packaging of Home Systems / 1:30PM: MMDS- The Business of Wireless Cable
2:25PM: Business Uses of Satellite/ 3:15PM: Role of Enthusiasts in TVRO Marketing
4PM: The Competition vs. Programming Charges

**FRIDAY
JANUARY
26**

Second Full Day of Advanced Seminar Courses (*)

Advanced Systems / Technical

10AM: CATV & SMATV Headend Design Criteria / 11AM: SMATV System Design
1:30PM: Cable & Powering Considerations / 2:15PM: Special Equipment For AsiaSat 2, Palapa C1
3:15PM: Fibre Optic Cable Criteria / 4PM: To be announced

Business Management Opportunities

10AM: OPTUS: The Neighbourhood Satellite System from Australia 11AM: PAS-2 and Others
1:30PM: Cellular Television / 2:15PM: Hybrid Fibre Optic Systems
3:15PM: Neighbour Traditional Cable TV / 4PM: MotelVision Systems and Services
(* / Schedule subject to changes; final schedule in printed programme at SPRSCS)

**SATURDAY
JANUARY
27**

Open Public Day / SPACE Pacific Membership Meetings (*)

10AM: Exhibit Halls Open to public - no entry fee
1PM: Country Music Television Dance Party (front pavilion)

Technicians & Testing Room (**)

11AM: Final shoot-out for "Best Receivers of Show" competition
(**/ Additional sessions during Exhibit Hall open hours January 24-25-26)

SPACE Pacific Member Forums (***)

9AM: Status of programming access report / 10AM: Sales and Marketing Forum
(***/ Additional sessions posted in SPRSCS printed programme)

a technical and marketing
advisory

memo
to the membership from your
industry trade association

SPACE Pacific

Satellite
Programme
Access
Committee



A trade association for
users, designers, installers, sellers
of private satellite-direct systems in the
Pacific Ocean Region

China Central Television (CCTV): FTA Digital

SPACE Member Harry Guo of Westlite Electronics (see detail in box insert) speaks and writes fluent Mandarin. This skill served him well in protracted negotiations with PRC's CCTV service which began transmitting on PAS-2 (TR2, horizontal) this past March on a 24 hour basis. Many have attempted to open the door of access to CCTV programming; Guo is the first with success and as a result free to air Mandarin/ (Cantonese)/English programming is now available to any home, any commercial establishment, any cable TV system anywhere in the Pacific region.

There are no monthly or annual (ongoing) charges for accessing CCTV programming; only the one-time Scientific Atlanta D9222 purchase cost. Units can only be authorised if purchased through Westlite Electronics (see box, right).

The first two units authorised for SPACE Pacific went into service October 21st. Since that time we have been actively sampling both the programming content as well as reaction to the programming from Mandarin speaking residents of New Zealand.

1) The programming is very broadly based from movies to opera to sports, regularly scheduled newscasts (in Mandarin and separately in English), and travel features. In short, it looks like and views like any high tech well equipped international TV network you would find on satellite.

2) Reaction from Mandarin speaking viewers:

"We like the newscasts the best and were surprised how little obvious propaganda there is in them." And, "The drama shows are excellent and the photography is breathtaking."

CCTV Availability Details

Source: Westlite Electronics, 117 Peninsula Road, Maylands, WA 6051 Australia
(Tel 61-9-370-5573; Fax 61-9-272-3060)

Technical: PAS-2, TR2 (horizontal), IF 1426 (+/- your LNB local oscillator stability), Scientific Atlanta MPEG 1.5 on programme channel "3", D9222 receiver

Authorisation: D9222 units are shipped by Westlite Electronics pre-authorised for CCTV to end user or TVRO dealer

IRD Source: Only from Westlite Electronics

IRD Cost: US\$1,850 FOB Perth outside of Australia; within, A\$2,850 ex-tax (duty, freight inclusive)

Programming: 24 hours per day, Mandarin, Cantonese (with Mandarin subtitles), English (approximately 20%, with Mandarin subtitles)

Programming Fee: None

Restrictions: D9222 receivers sourced from other suppliers cannot be authorised for CCTV; do not even ask.

Availability: 30-40 days from date of order and payment at this time; planned 10 day turn around by end of first quarter 1996.

Registration: Dealers are allowed to stock only one unit at a time, must advise Westlite of end user name, address, type of use (i.e., private, SMATV, cable TV) when ownership transfers from dealer.

Programming Schedule: SPACE working with Guo to make two-week advance schedule available to users; details in SPACE Membership Bulletin.

Sample Tapes: NZ\$15, A\$20 in VHS format from SPACE Member Robin Colquhoun, 32 Valley Rd., Mt. Eden, Auckland (64-9-630-7127).

SPACE Members have previously been advised of this new service through the SPACE Membership Bulletin. Attendees at SPRSCS in January will have an

WHAT??? You Don't Belong To SPACE ... YET???

With SPRSCS fast approaching, there is no better illustration of why you should belong to SPACE; to save money. Individual dish owners who belong to SPACE save \$75 in SPRSCS registration fees over non-members, yet your annual SPACE membership costs only \$30. Installer / Dealer Members save \$50 per person (with no limit on how many firm members may attend the show) yet pay only \$75 per year to belong. Want a second reason??? SPACE Members learned weeks ago about the availability of CCTV and the hotel/motel SMATV system charges detailed in this month's report, giving them a competitive jump on non-members of valuable weeks time. Want more reasons? Contact SPACE Pacific, PO Box 30, Mangonui, Far North, New Zealand (fax 64-9-406-1083).

opportunity to judge the saleability of the service themselves. CCTV should help you sell dish systems!

Commercial Service For Hotels/Motels

SPACE Member firm Global•Vision (contact: Michael Fleck, Global•Vision, Suite 4, 14 Sydney Rd., Manly, NSW 2095, Australia; tel 61-2-9977-0188, Fax 61-2-9977-0934) is now able to offer a significant list of commercially (not home DTH) available programming services as well as complete commercial TVRO receiving systems (from dishes to modulators). It is not a requirement that you purchase your equipment from Global to qualify a commercial client for access. Some of the services shown have both geopolitical (i.e., country by country) restrictions and/or minimums. ESPN, for example, is not available in New Zealand (except with the approval of Sky Network), and always requires a (US) dollar minimum amount per decoder per year, usually in the range of a 100 room minimum.

Note that ABN is via PAS-2 in MPEG digital format (not B2P/C1 in FTA analogue); that ANBC charges will be based upon their going digital by scheduled March 1996 date; and, CMT may now be available to DTH homes in Australia after approval for Foxtel and Optus cable late in October.

Programmer	Description	Cost to Hotel	Receiver
ABN	Asia Business News	Enquire	US\$2,100
ANBC	Asian and US financial news	no charge until 3/96	Enquire
CCTV(-4)	China Central Television	Enquire	Enquire
CMT	Country Music Television	US\$25 per year per room	US\$1,590
CNN	24 hour news	Enquire	US\$700
CTN	Chinese Television Network	US\$32.85 per room per year	US\$1,750
Discovery (*)	Science documentary	Enquire	US\$2,100
ESPN (*)	24 hour sports	US\$30 per room per year	US\$2,100
MTV (**)	Mandarin music videos	US\$25 per room per year	US\$2,100
TFC	The Filipino Channel	Enquire	Enquire
TNT	Movies, cartoons	Enquire	US\$2,100

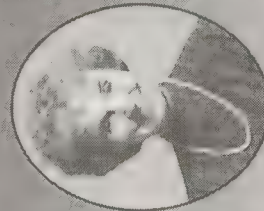
*/ Not available all Pacific geopolitical regions

**/ Only available to hotels with significant Mandarin speaking clientele; documentation required.

RF & MICROWAVE FILTERS FOR ALL TV NETWORKS

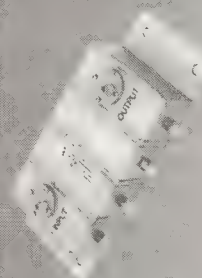
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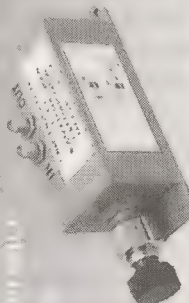
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WITH THE OBSERVERS

AT DEADLINE:

Observer Stephen Holzt reports JCSAT-3 testing on C-band at IF of 1167 (Nov. 7), picture P1. This satellite has Hawaii C-band spot beam which could explain poor signal level in New Caledonia. Evening of Nov. 6, ATN again running in 1/2 transponder ("ATN Prime") format.

JCSAT-3 has been testing Ku AustralZealand 46 dBw footprint transponders (IFs of 1028 and 1100/1108), horizontal polarisation, according to observers **Brian Rasmussen** (WA) and **David Pamberton** (NSW) and others; generally reports are that signals are "very strong" (P5) on 2m and somewhat smaller dishes. C-band activity on JCSAT-3 has not reoccurred since the testing reported in SF#14. This satellite is obviously alive and well and very capable of providing both C and Ku service to most of the area west of 160W; now all it needs is programmer customers!

Galaxy MPEG-2 DVB compliant service via B3 continues to be delayed, latest hoped for start-up date is "before Christmas." Approximately 30,000 of the PACE DGT 400 receivers are now in Australia, sources say there are "software problems" associated with the Iredito conditional access system. One source advises SF "It takes between 3 and 4 seconds for the receiver to lockup on a new programme channel when changing programmes on the same transponder," a definite impediment to channel surfing. And that's the best case: When receiver is surfed from one transponder to another (two transponders are in use for the up to 12 programme channels), time delays stretch out even further. Getting your hands on one of the 30,000+ units in warehouses won't get you very far: Units come out of the box with a default frequency of 12,438 GHz (IF of 1,138) which is transponder 11H for B3, but user cannot gain access to installer's menu without knowing a not publicised 4 digit pin code. Perhaps an installer reading this could pass along to SF the pin code number for accessing the installer's menu??? In other B3 news, more and more news/sports/bulletin feeds are being seen on TR2V (IF1003) in addition to feeds formally found only on 3, 5 and 7 (vertical).

ATN on G2 (IF 1464 from previous 1483 nominal) has been testing two programme channels in single transponder. Test card on second service reads "ATN Prime" and Indian cable press suggests movies and US/European off -commercial -network programming is planned for this second channel of service, some of it in original English. ATN remains one of the "financially shaky" occupants of Rimsat satellites (see SF#14,



Observer Tony Hobson (Newcastle, NSW) uses a trio of dishes (3, 1.8 and 1.2m) and has an unusual bit of "bonus" reception (see report, p. 26)

p. 24) so even the best announced plans are subject to their financial ability.

Fun and games on I180 (satellite 511) apparently went unnoticed by many who no longer routinely cruise this satellite. **David Pamberton** (Muswellbrook, NSW) reports most of the I180 transponders were shut down around 0700UTC on 7 October until early on the 8th. Pamberton suggests that 511 has been replaced with a newer satellite but that does not check with our Intelsat report appearing here (p. 25). He finds some of the regulars such as WorldNet "stronger now" and notes, "I have been able to drop the narrowband mode for WorldNet on my Cherokee 300 in favour of wideband with better pictures now." SF believes the Intelsat data found on p.25 here is accurate but solicits additional observer reports on the relative present quality of I180 versus the performance of a few months back.

Solomon Islands legislation (Television Act 1995, section 28) will require those owning satellite dishes to pay an annual fee or face a fine of \$5,000 and/or imprisonment of up to 3 years (!). An attorney in Honiara, **Andrew Radclyffe**, is mounting a defence to the proposal and is concerned that the fees will be excessively high. The Solomon Islands government has recently taken bids for creation and operation of a 'national'

WITH THE OBSERVERS: Reports of recent changes in satellite operations, programmer sources, equipment changes are encouraged from readers throughout the Pacific Ocean Region (POR). Information shared here is a valuable tool in increasing our collective knowledge and understanding of the POR satellite 'universe'. Off-screen photos are not difficult to take: Use ASA 100 speed film, set TV set to slightly increased brightness and aperture opening to f3.5 to 5. For PAL or SECAM, shoot at 1/15th of a second, for NTSC at 1/30th. Mount camera on tripod (no flash!) or hold steady. Alternately, record reception on any format/speed of VHS tape and send to SatFACTS for photographing. Note deadline for December issue is 5PM (NZ summer time) December 4th; alternately, fax to 64-9-406-1083.

Intelsat and Other 1995/6 Launch Plans

Before 15 December 1995: **AsiaSat 2** launch by Long March rocket to 100.5E

January 1996: **Palapa C1** by Atlas rocket to 113E

April 1996: **Palapa C2M** by Atlas or Ariane launcher; destination uncertain but 118E likely
("First half" 1996:) **Russian Express** (designated #6, but actually second one) to 80E

June 1996: **Intelsat 801** by Ariane launch to 174E

(August 1996: **Intelsat 701** replaced at 174E by 801)

(August 1996: **Intelsat 511** at 180E replaced by 701)

September 1996: **Intelsat 802** launch by Ariane to 177E

(November 1996: **Intelsat 703** at 177E replaced by 802)

("Second half" 1996:) **Russian Express** (designated #5 but actually third one) to 53E

("Second half" 1996:) **Russian Express** (designated #7 but actually fourth one) to 90E

("Late" 1996:) **Thaicom 3** to 78.5E

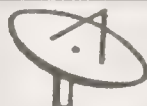
December 1996: **Philippines MPSC Group**, C + Ku to either 134E or 150.5E

Intelsat 503, occupying 177W (183E) has now been replaced with 513 which previously had been used at 53W. 513 has an inclination of 0.05 degrees and is therefore stable at this time. It has C-band hemispheric beams and zone beams. The hemi beam covering the Pacific from approximately 180E towards the west has a peak eirp of 29 dBw while a zone beam favouring Japan and Asia has a 29 dBw footprint as well. On Ku, 513 has the capability of interconnecting the west coast of the USA with Japan and China at a boresight eirp of 43 dBw. Since the transfer from 503 to 513 late in September, observers report considerably increased broadcast network TV feeds on 513 C-band including many one-off programme relays. In some respects, 1177W has assumed the 'look' of 1180 of one year ago.

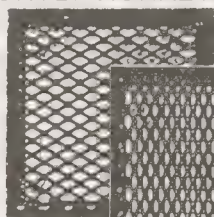
terrestrial TV service (there is no local TV there) and the proposed fees could have a double intention: Raising funds to help pay the costs associated with the new terrestrial service, and to discourage residents from installing dishes in lieu of watching the new national service.

Les Brooks (Alice Springs) reports he has found weak but identifiable (Ku) signals from JCSAT 1 and 2 located at 150E and 154E using a 1.5m dish and he suggests those living

further east and north of him might have better results. These high power (53 dBw at boresight) birds would appear in the IF range between 983 and 1343 for receivers equipped with LNBs using a local oscillator at 11,300 MHz. Most of the transmissions (but not all) are encoded in various analogue formats and both linear vertical and linear horizontal polarisation is in use. Brooks' report is the first of such reception from south of the equator.



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RIMSAT vs INTERSPUTNIK: Update

SF#14 reported that the Russian agency Intersputnik had taken over physical control of Rimsat G1 and G2 satellites during September after attempts to resolve outstanding contractual disagreements between the two parties had failed. Rimsat's VP of Marketing and customer services Tim Brewer suggests resolution of the issues "may take years" and that for the foreseeable future Rimsat, as an entity leasing Gorizont class satellites and leasing out transponders to third parties (such as EMTV), is essentially 'out of business'. Reporting to SF from Moscow, Brewer notes:

"Intersputnik is clearly in the saddle as operator and virtually all Rimsat customers have come to a new agreement (with Intersputnik) at standard (IS) tariff rates. The only customers not to continue services (under the new rates, which are higher than Rimsat charges) are Cellcom and Domsat and these transponders have been shut down (Cellcom was the narrow band service found at an IF of 1,375 on G2; a wonderfully stable [if useless for watching TV!] signal that was very helpful in aligning dishes to G2, previously.)"

"Transponders now available for (new) lease include hemi-beam TR8 on G42, essentially the same beam and coverage as EMTV, plus hemi-beam transponders G8 and 10 on G41. If no one goes for TR8 on G42 in the next few months, I have proposed trying to use it for a Pacific islands exchange channel. Anyone have any better ideas?"

There is an obvious commercial opportunity here for the Pacific; EMTV like coverage on G42 at annual leases approximating US\$1.3m or less (subject to negotiation of course).

Note that the Russians have redesignated G1 as G41 and G2 as G42. Brewer can be reached by fax at 00-852-2845-9175.

Observers should keep an eye on IF 1375 on G42 and in Northern Australia IFs 1275 and 1375 on G41 for signs of new programme operators.

Harald Steiner in Tokyo advises that Australian ATVI programming is being reported on AsiaNet service on Rimsat G1 (IF 1325 MHz), "for a number of hours each day." And he asks if anyone can confirm this. ATVI is normally distributed only by Palapa B2P (113E) but given the disregard many Indian programmers often exhibit for the finer points of copyright legality, it may well be that ATVI is being looped from B2P onto AsiaNet; perhaps, even, with ATVI permission.

High tech field tip of the month. If your C-band antenna feed mouth cover requires replacing, **Ross Morrison** (Chatham Islands) suggests you purchase a can of Nestles Kwik with a blue lid, punch a few breathing holes in it, and discover (as he did) that it is a perfect fit!

Tony Hobson (Newcastle, NSW; see photo, p. 24) reports his neighbours secretly believe him to be a Russian spy with his three satellite dishes. A Telecom microwave relay tower loaded with microwave dish antennas causes him to lose reception from PAS-2 NHK and I180 RFO. This suggests a 4,035 MHz C-band transmitter radiating from the tower, Tony. He wonders how he can eliminate the terrestrial interference. There are several answers, all originate from Communications Energy Corp. which pioneered "TI Traps and Filters" in the USA when this problem first appeared in the early 1980s. See their advert on p. 23 of this issue. Incidentally, Tony reports that Telecom video signals from his neighbourhood tower



Australian horse racing continues to be transmitted on I180 in B-MAC encryption; does anyone have contact information to assist potential subscribers to this service?

often contain Australian horse racing, sport and news feeds from around Australia. Some people would lust for that, Tony!

Religious outreach teleconferences continue to appear from time to time on PAS-2, Ku. Latest has been the Philadelphia Church of God telecasts in the 1930-2200 UTC time frame.

European hackers claim to have broken into a segment of the AFRTS B-MAC encryption; AFRTS and their network manager SA have apparently responded by modifying the authorisation routine. AFRTS is transmitted in NTSC encrypted form on I177E (IF 973 MHz) and receivers while normally limited to US military installations are also found at US FBIS and Embassy locations. Hackers claim they were successful in breaking the codes after obtaining units from Saudi Arabia and Bahrain. During Gulf War period, several hundred SA B-MAC units were reported to have been "confiscated" by government authorities there to shield viewers from televised coverage of war activities. At least one of these units subsequently ended up in hands of London based hacker group. Be wary of pirate offered AFRTS units; network manager SA has only begun to fight back on this latest piracy activity.

SATELLITE LOCATOR

Windows Based Database Program

ENTER as many satellites and site locations as required.

REQUIRES latitude, longitude and true north co-ordinates for each site.

DISPLAYS satellite co-ordinates for true or magnetic north.

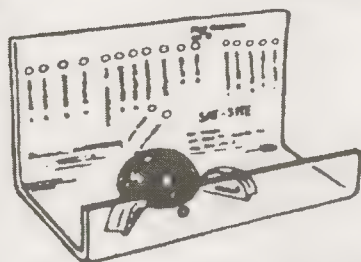
CALCULATES azimuth, elevation, declination and apex declination for each satellite in the database.

PRINTS out all the satellite co-ordinates for the sites.

PRICE: (NZ) \$25 + GST

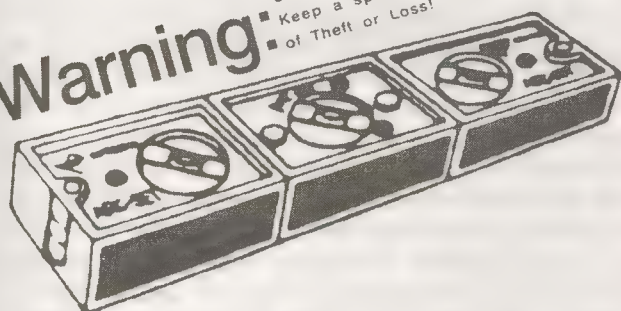
USER TRONIC Developments Ltd, PO Box 29 124,
Auckland, NZ / ph 025 938 730 or 61-9-443-1679

Precise, yet Simple, Dish Installation Tools:



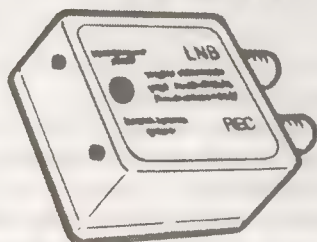
Sat Sites Custom built to your locale, survey sites for obstructions to reception of Satellites! Within their 100-mile ranges, Sat Sites are Robot Salesmen (by involving your clients). **\$89/ea for American C & Ku; \$99/ea for European Ku & \$123/ea for World-wide (all video).** OPTIMUM "Polar" Alignment Analysis included.

Warning Use is Habit forming
Keep a spare, in case
of Theft or Loss!

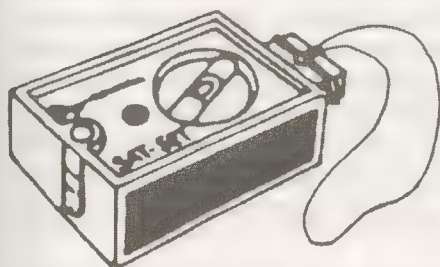


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THE CABLE CONNECTION



System Planning and Implementation

Any cable television plant, whether an extension of an SMATV system serving a single facility such as a hotel/motel, or a complete community-wide cabling project, depends upon precise control of signal levels within the coaxial cable at all points. Cable loss (attenuation as a function of cable length and the operating frequency of the cable channels) is well known to the nearest 1/100th of a dB per 100 metres. Cable system appliances (directional taps, signal splitters, amplifiers and even fittings) have known loss or gain, again to the nearest 1/100th of a dB.

With a suitable background, a system planner begins with an accurate (1% error) set of street and dwelling maps for the area to be cabled. If you know precisely how far it is between any two points within the system, and you also know the losses (cable, splitters, directional taps and fittings) or gains (amplifiers) for each piece of equipment you will use in the system, a system can be planned "on paper" and then constructed following those plans.

Within a piece of coaxial cable there is attenuation (loss). The higher frequencies (such as 450 MHz) attenuate faster and with greater losses than the lower frequencies (50 MHz). Yet you desire to maintain a "balance" between all channels on the system (whether at 50 MHz or 450 MHz) at every subscriber "drop" location. You achieve this balance by using a combination of greater amplifier output power (signal level) at the higher frequencies in the system, and a device known as an equaliser between amplifiers. The higher output levels at 450 MHz are adjusted to ensure that when the signals reach a point where another amplifier is required, both the highest and lowest frequencies within the cable plant are now even in signal level; "flat" in the trade.

But between those two points (the output of one amplifier and the input to the next) there is an obvious imbalance; the closer you are to the output of an amplifier, the greater the signal level will be at the higher frequency end of the system channels. This means that any home connected to the cable close to the output of an amplifier will be likely to receive an over abundance of signal at the higher channel frequencies.

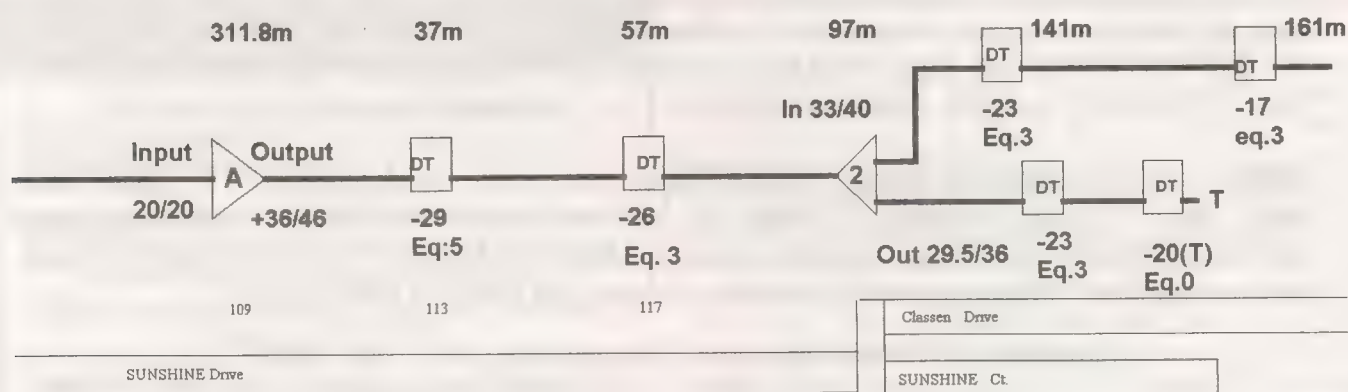
An equaliser is a frequency selective attenuator. Available in a wide range of values, this in-line device typically passes the lower channels with no attenuation but as the channel frequencies increase, the equaliser adds attenuation. In this way an individual home "drop" can be fine tuned by the installer to ensure that all of the channels from the lowest in frequency to the highest in frequency arrive at the TV set(s) at approximately the same signal level. Equalisers are installed at the customer signal tap-off device (directional tap) in line to the customer's home, after computing the additional effects of loss vs. frequency likely in the (smaller) "drop cable" that connects the home to the feeder or main (trunk) line.

Distances, throughout the cable plant, are very important because distance in metres directly translates to cable loss at the various frequencies carried by the cable system.

Measuring distances is mandatory; scaling from maps may work if the maps are high resolution and very accurate but as a rule there is no substitute for actually measuring the lengths of cable required within the cable plant before it is engineered on paper and subsequently constructed. "Pacing off" distances is not adequate and a 100' or 100 metre tape measure is at best a difficult tool to use in the field over and over again for as many times as you require separate measurements.

The answer is a tool commonly employed by surveyors, road construction firms, and anyone else who needs to know with accuracy how far it is from point A to B (to C to D et al). A measuring wheel equipped with a counter (that tells you how far the wheel has rolled, typically to the nearest 1/10th metre) is a first level investment for a cable system planner. The price varies from A/NZ\$300 to three times that amount as you decide which options you require and elect a level of sturdiness you will require. Some measuring wheels are only designed to be operated on relatively smooth surfaces (golf courses, paved streets) and if you have some less than smooth terrain to cover, the model you select may need to be more rugged.

To complement a measuring wheel you will need to develop new record keeping habits, maintaining a notebook in addition





Measuring wheel makes precise cable plant lengths a known rather than a guesstimate

to perhaps using locally available council or utility company line maps as a rough guide to distances and property lines. In most cable TV situations, you will run your cable(s) down front or rear lot lines and place a subscriber tap-off device (directional tap; DT) typically at every second shared lot line boundary. The precise location of each DT, splitter and amplifier should be planned in advance after you have wheel measured the distances. As you wheel the cable lines, you will quickly find yourself making decisions on where DTs and other equipment should be placed based upon what you see. All of this information should be recorded in notebooks and the probable cable lines drawn on the maps (also noting equipment locations) as you walk the community. Once this exercise is completed, you can then go back to a quiet location and with suitable information detail the design of the system on a scaled map of your own making.

From this map and your notebook will come an equipment list for each section of cable: So many DTs, connectors, equipment housings, line splitters, amplifiers and even subscriber equalisers. If you are building the cable plant in sections and turning on each section individually, the equipment required for a section becomes a bill of materials and a budget tool for system financing. And it all begins with knowing the precise distances for each portion of the cable plant.



Shown: Trurometer Distance Measurer

One source for Trurometer and other measuring devices:
Labsupply Pierce Ltd, 165 Sunnybrae, Glenfield, Auckland
NZ (Tel 64-9-443-5867)

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SOUTH PACIFIC REGION SATELLITE & CABLE SHOW JANUARY 23-27 AUCKLAND

THE AGENDA

January 23: Annual SPRSCS "Antenna Raising Party." Come anytime after 10AM to observe how satellite dishes are assembled, mounted, "arced" and fine tuned. **January 24:** *SATELLITE TV BASICS*. Full day seminar for "first timers" and those needing a refresher on the intricacies of satellite system installation. **January 25 & 26:** Full day seminar sessions on two simultaneous tracks (Business Opportunities Management and Advanced System Technical). **January 27:** "OPEN PUBLIC DAY" with exhibit halls open to the general public, special CMT (Country Music Television) USA *Dance Party* 'Stage Show', and SPACE Pacific membership meetings and forums.

THE EXTRA EVENTS

TECHNICIANS & TESTING ROOM: A special hands-on "laboratory room" equipped with test equipment to evaluate the performance of receivers, LNBs, actuators, feeds, modulators and more. Scheduled events: "Receiver Shoot-out" to determine the "best" receivers available to the Pacific, and, "MPEG IRD Forum" to teach you how the Scientific Atlanta D9222 IRD units are programmed and work to their best capability, and, Society of Cable Television Engineers (SCTE) cable TV technology training tapes on continuous display.

University of Auckland 7.3 metre "Near Space Monitoring Station" tours: Only 300 metres from the exhibit area, scheduled tours of the dream facility assembled by the University to keep tabs on all of the satellite excitement and offerings from 120W to 100E! USA Domsat reception - see it for yourself.

MULTIPLE EXHIBIT HALLS: All of the latest equipment, plus live displays from more than 2 dozen channels many of which you have never seen before. Exhibit Halls open specified hours January 24, 25, 26 and open to the public January 27.

SPRSCS REGISTRATION PROCEDURE

NUMBER ONE

COMPLETE REGISTRATION INFORMATION BELOW
(You may copy this form if you wish to leave your SatFACTS issue intact!)

NON-SPACE MEMBER (*) PERSON 1	NAME _____	COST NZ\$225 gst \$25 included
	Company _____	
	Mailing Address _____	
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	Show Days Will Attend: <input type="checkbox"/> 23 / <input type="checkbox"/> 24 / <input type="checkbox"/> 25 / <input type="checkbox"/> 26 / <input type="checkbox"/> 27	

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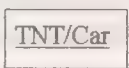
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SPACE Pacific, PO Box 30, Mangonui, Far North, New Zealand

SatFACTS PACIFIC OCEAN ORBIT WATCH: 15 November 1995

Copyright 1995: SatFACTS, PO Box 330, Mangonui, Far North, New Zealand (Fax: 64-9-406-1083)

IF Freq	Gz25/103	G1/130	Gz18/140	G2/142	Gz21/144	P169/Vt	P169/Hz	IF Freq	180/RH	180/LH
1,475	DubITV	RAJ(X2)	DubITV	ATN(X2)	DubITV			1,432	Keystn	
1,425	Muslim	SunMovie	Muslim	JJAY				1,388	MPEG	
1406/1425						CMT/CBS	ABN/CTN/CCTV	1,325	MPEG	
1,375	APNA	(vacant)		(vacant)				1,310	MPEG	
1346/1372						MTV/b	Discov/b	1,277	NBC/e	
1,325		AsiaNet		EagleNet				1,256	Keyston	
1288/1300						ESPN/h	OccVid	1,223	CBS/e	
1,275		(vacant)		EMTV	Moscow 2			1,179	WNet	
1235/1249						P2/Sylmar	AsiaFeeds	1,137	NHK/e	
1,225		SunMusic		Udaya				1,105	RFO	1092/data
1161/1183	JCSAT-3 / 128E Testing of transponders seen on C (IFs 1107, 1122, 1197) and Ku (IFs 1028, 1100/1108 Hz) from early October.						Prime/d	CNN (X2)	1,054	(data) Canal +/d.
1110/1115								NHK	1,021	Aust 9 Aust.9
1038/1060							ANBC	FilCh/d	988	NZ/dig.
998/985							TNT/Car/b	(data)	980	NZ/dig.
November 1995 NOTES ▶/b is B-MAC (NTSC or PAL depending upon service) ▶/d or /dig. is some form of digital (MPEG) ▶ Intelsat 1180 includes right and left hand circular transmissions (separate) ▶/e indicates some form of analogue encoding (such as Leitch system on I180) for which there is no readily available decoder▶ (X2) indicates 1/2 transponder format with typically two programmes present ▶ Ku IF's for A3 and B1,3 satellites (below) are for standard LNB LO of 11,300										
<div>  indicates reception on 3m or smaller antenna <div>  </div> underline indicates subscriptions may be available/SF#10, p.18 </div>										
I177W/I177E/I174E IFs of 984 & 963 carry many international news feeds in right hand circular (I177E, 174E); on I177E, IF of 973 carries AFRTS in B-MAC, left hand circular with AFRTS radio subcarrier. 177W now 513 bird, new FTA video activity seen daily.										

Ku BAND ACTIVITY UPDATE

A3/B1TR	IF Freq	B3: 155.9E	B1: 160.0E	Satellite	RF Freq	Coverage Beam	Service Report
1(V)	977		Tab radio; data	PAS-2	12,334	NE Asia	Now MPEG
5L(V)	1,193	ETV>0000UTC	Occ.Video, news	PAS-2	12,700	NE Asia	PAS-2 Sylmar
5U(V)	1,218.8		Occ.Video	177W	10,980V	Japan, Asia	US Net feeds
7L(V)	1,344	TVO>1200UTC	ABC Nation./b	177W	11,015V	Japan, Asia	NBC News
7U(V)	1,370		SBS Nation./b	177W	11,510V	Japan, Asia	
10(H)	1,075.75	Galaxy NTL digi	Galaxy GI Digital	180E	11,480H	Japan, Asia	CBS
11(H)	1,138.5	Galaxy NTL digi.	Galaxy GI Digital	180E	11,510H	Japan, Asia	CNNI
				145E	11,525H	Asia	Sakha TV/occas.
				130E	11,525H	Taiwan, China	(Cable pgming)
				96.5E	11,525H	Asia	Active ??

Optus B3 activity continues to mature with additional video now seen on TR2V (IF near 1005). Galaxy DTH using NTL DVB system and Iredito conditional access continues to be bogged down with "software" glitches and may not actually begin operating until towards end of December. In meantime, old style Galaxy General Instrument Digicipher 1 on Optus B1 was scheduled to shut down 15 November, of late, has been 'FTA-Digicipher' for many services including CTN, Italia, ANBC, Red and others.

SatFACTS DATA SHOPPE

YOUR Source For Reference, Study Materials In The World Of Satellite TV

ENTRY LEVEL:

☐ **SATELLITE TELEVISION: All You Need To Know.** Brand new 28 page booklet with four-colour cover designed to help you educate potential customers about the joys of owning a home dish system. Sold through SPACE Dealer Members at \$10 to individuals. Single copies available via fast post within NZ (NZ\$10) or elsewhere (US\$10) using order form on page 33 here.

☐ **TB9402 / MATV: Master Antenna Television Systems.** How to plan, select equipment for and install multiple outlet systems for motels, hotels, apartment flats and condos. Practical step by step guidance. Price: NZ\$20 world-wide.

☐ **TB9404 / Home Satellite Systems.** What the parts are, how they go together for POR home TVRO systems; how you create a working system with maximum performance at minimum outlay. Price: NZ\$20 world-wide.

☐ **TB9405 / Commercial Satellite Dish Systems (SMATV).** If you are building a system from scratch, also order TB9402 for the MATV portion basics. If you are rebuilding an existing MATV system to add satellite signals, you need this! Price: NZ\$20 world-wide.

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DISH OWNING ENTHUSIAST LEVEL:

☐ **Coop's Satellite Operations Manual.** Originally written 1980, this manual explains how you locate and interpret the multitude of wide and narrow band signals available via satellite. Dozens of fun, new ways to get more from your dish system. Price: \$NZ30 world-wide.

☐ **Gibson Satellite Navigator (O/w 1980).** The mechanics of the Clarke Orbit Belt, how a dish tracking system is designed and operated to allow full horizon to horizon reception with a motorised dish system. Very practical, very hands on with plenty of do-it-yourself instruction for inexpensive systems. Price: NZ\$30 world-wide.

☐ **Coop's Basic Manual on Fine Tuning Satellite Terminals (O/w 1980).** The little things such as feeds, connectors, powering. Tips from the people who started home dish reception in the 1970s, building the foundation for the present TVRO industry day by day, discovery by discovery. Very practical, very hands on. Price: \$NZ30 world-wide.

■ **ALL 3 (Two from Coop, one Gibson) as a package for NZ\$70 (you save \$20).**

BUSINESS MANAGEMENT REFERENCE MATERIAL:

☐ **CTD 9507/ PLANNING AN UPLINK - How You Make Money.** A thorough outline for making money and avoiding bottomless pit investments in the creation of a Teleport (uplink) service. Price: NZ\$30 world-wide.

☐ **CTD9508 / New Zealand Cable Wars Heat Up.** The inside story of how Telecom is trying to control all pay television in New Zealand. Price: NZ\$30 world-wide.

☐ **CTD 9509 / Australia: The Battle for PAY TV Subscribers.** An overview of the bloodiest competition in pay television the world has ever seen as Optus and Foxtel launch against lightweight Galaxy in Australia. Price: NZ\$30 world-wide.

SatFACTS November 1995 POR OBSERVER REPORTING FORM

(Please FAX [64-9-406-1083] or mail to arrive by 04 December)

TELL US what you are seeing, or using for equipment, that is new within the last 30 days. Observer reports (see "With The Observers" page 24) form an important part of the growing body of information we all share monthly.

- **NEW programming sources** seen since 1 November: (Please list receiver 'IF' or satellite transponder number if known) _____

- **CHANGES in reception quality** since 1 November: _____

- **EQUIPMENT changes** at my observing terminal since 1 November: _____

■ My Name _____ Address _____
Town / City _____ Country _____ (Please turn form over)

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I wish to order the following reference materials (see description page 32):

- ☐ **SATELLITES: All You Need To Know** (\$10 inside NZ, US\$10 elsewhere; description p.29)
- ☐ **TB9402 / MATV** (NZ\$20; SPACE Members \$15).
- ☐ **TB9404 / Home Satellite** (NZ\$20; SPACE Members \$15).
- ☐ **TB9405 / Commercial Satellite** (NZ\$20; SPACE \$15).
- ☐ **ALL THREE / TB9402, 9404, 9405** (NZ\$40; SPACE \$30)
- ☐ **Coop's Satellite Operations** (NZ\$30; SPACE \$20).
- ☐ **Gibson Navigator** (NZ\$30; SPACE \$20).
- ☐ **Coop's Basic - Fine Tuning** (NZ\$30; SPACE \$20).
- ☐ **ALL THREE / OPERATIONS, NAVIGATOR, BASIC** (NZ\$70; SPACE Members \$50).
- ☐ **CTD 9507/ UPLINKING: An Investment Opportunity** (NZ\$30; SPACE Members \$20)
- ☐ **CTD 9508 / New Zealand Cable TV Wars** (NZ\$30; SPACE Members \$20)
- ☐ **CTD 9509 / Australian Battle for PAY TV Subscribers** (NZ\$30; SPACE Members \$20)

Instructions:

- ☒ Check off items you wish airmailed to you
 - Make cheque to Far North Cablevision Ltd. or provide VISA info
 - Complete reverse side of card

■ YOUR equipment survey:

Size dish(es): _____; Noise Temp LNB(s): _____

Make/model receiver(s): _____

Make/model standards conversion: _____

If mailing report: SatFACTS Monthly, PO Box 330, Mangonui, Far North, New Zealand

SOUTH PACIFIC REGION SATELLITE & CABLE SHOW / SPRSCS INFO PACK REQUEST

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Return to: **SPACE Pacific**, PO Box 30, Mangonui, Far North, New Zealand

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